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MOTORSHIP

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In the Interests of Commercial Motor Vessels

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SEATTLE

NEW YORK



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THE HAMBURG-AMERICAN LINE MOTORSHIP "MONTE PENEDO"

In Hamburg Harbor. Now Laid Up Owing to the War. She Was the Most Successful of the Large Two-cycle Type Diesel Vessels.

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Earnings of American Motorships vs. British Steamers.

Figures laid before the Committee on Merchant Marine show a gain of \$50,000 per annum with a ship of 4,665 gross tons, and with freight at \$12.00 per ton.

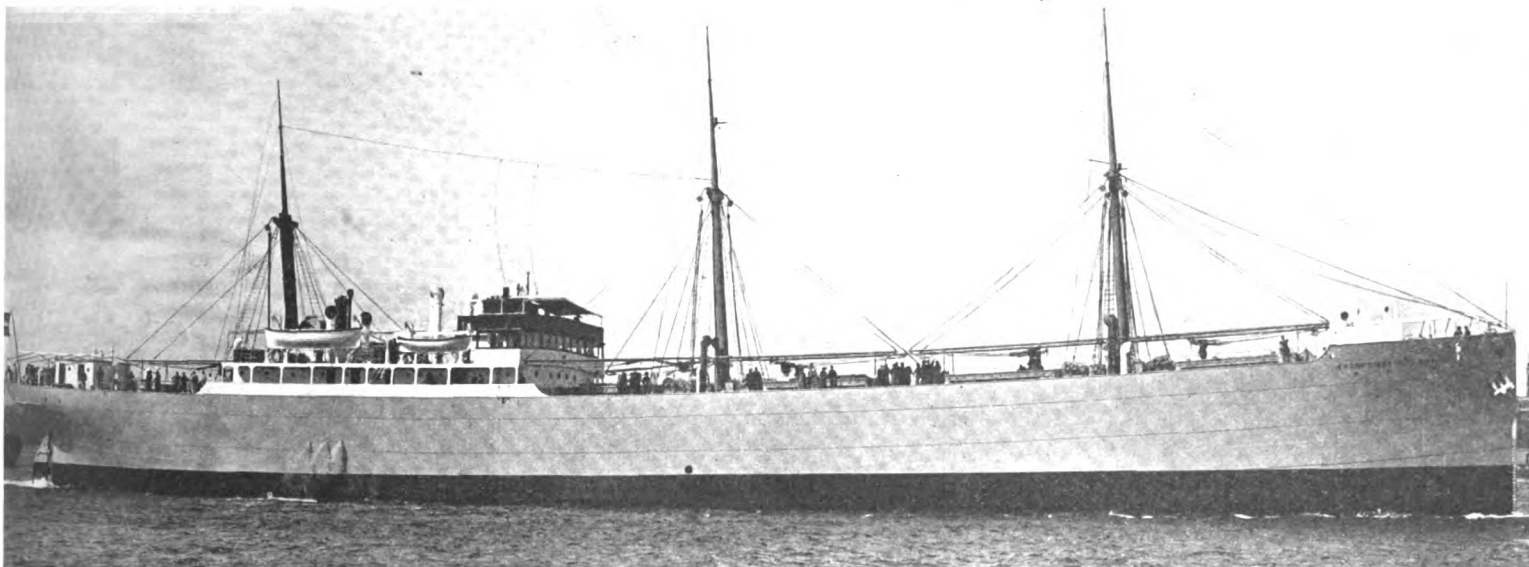
During the hearings before the Committee on Merchant Marine and Fisheries held in connection with creating the new Shipping Board, some interesting figures were given by Captains Ellsworth P. Bertholf and C. A. McAllister of the U. S. Coast Guard Service. Unfortunately whilst they took into consideration the value of the extra cargo-capacity of a motorship, they omitted to state the displacement figures in making their comparisons. For instance, a 12-knot motorship of 9,000 tons displacement will have an actual cargo capacity of 6,100 tons, and a D. W. C. of 6,500, whereas a steamship of 9,000 tons displacement will have a D. W. C. of not more than 5,700 tons or a cargo capacity of about 5,300 tons. Hence, with the larger ship taken as an example, the extra cargo that can be carried is given as 400 tons, whereas it should be at least six-hundred, if not eight-hundred, hence the total

(\$26,520.00 per annum) while for the average foreign competitor with Asiatic crew it was \$1,150.00 per month (\$13,800.00 per annum). The American vessel was thus handicapped in the Pacific trade with an additional cost of \$1,060 per month on wages alone (\$12,720.00 per annum) which it is claimed is the principal item in the difference in cost of operation.

Assuming that our typical new freighter is equipped with the modern type of Diesel engine, burning crude oils by internal combustion, there will be certain elements of economy of operation incident to this type of propulsion, as follows:—

(1) Less cost of wages of operating force, due to the smaller number of men required.—There seems to be, in the opinion of experts a question as to the economy of operation of a Diesel engine (including cost of fuel), due to higher initial cost, greater insurance rates, and possibly

dead-weight cargo rating. To be well within conservative limits, the assumption is made in the typical ship that her dead-weight capacity is increased from 7,880 to 8,280 tons (400 tons) a trifle over 5 per cent. Prior to the existing war the freight rates between Chile and the United States, on the average of all bulk commodities, is shown by the Consular Reports to have been approximately \$12.00 per ton. At the present time they have increased about 80 per cent over that figure, and in the case of nitrates, the principal article of export, the increase has been 100 per cent. Again, taking a conservative estimate, we will assume an average freight rate of but \$8.00 per ton, weight or measurement. In a 400-ton increase in capacity this will amount to \$3,200.00 per one-way voyage, or \$32,000.00 per annum for five round trips, in favor of the typical ship having Diesel engine.



MOTORSHIP "KRONPRINSESSAN CECILIE"

extra earning capacity should be about \$50,000.00 per annum instead of \$32,000.00 as given. However, it clearly is stated that the 400 tons quoted is a conservative figure. It will be noted that the fuel saving is given as \$18,644.00, which makes the total saving compared with a steamship to be over \$50,000.00, whereas it should total close upon \$80,000.00 per annum.

As a typical example of a cargo-ship the following description is given by the above mentioned captains:—

Gross tonnage	4,665
Net registered tonnage	2,930
Dead-weight cargo capacity	7,880
Steaming radius	3,500
Average sea speed (knots)	10½
Indicated horsepower	2,500

A large proportion of the proposed naval auxiliary reserve fleet contemplated by the Shipping Bill will naturally be vessels of that size. In order to compare the relative costs of operation of an American vessel and of the average existing foreign competitor in the Pacific Ocean, this type of vessel will be used. The cost of wages and of fuel are the main items of expense in the operation of any vessel. This vessel will have a crew of 44 officers and men. From various sources it is found that the cost of wages per month on the Pacific Ocean for an American vessel with an American crew was \$2,210.00

greater cost of repairs, although the preponderance of opinion points out that there is a tangible saving in cost of operation. For the purpose of this comparison this item will be ignored, in order to be entirely conservative.

(2) Less cost of fuel for operation.—There is absolutely no question concerning the great saving in cost of fuel. To arrive at a comparison we will assume this typical freighter as operating between San Francisco, Cal., and Valparaiso, Chile, and that she makes only five round trips per annum. The distance between ports is 5,140 miles. On each voyage the average consumption of oil will be 231 tons; the same ship fitted with the average steam machinery using coal will use 597 tons. The cost of coal on the Pacific coast may be taken at \$6.00 per ton, and of oil at \$7.00 per ton. Applying these factors we find a saving in fuel each one way voyage of \$1,965.00 or \$19,650.00 for five round trips.

(3) Gain in freight-carrying capacity owing to less space occupied by the propelling machinery and less space necessary for storing fuel, which, it has been demonstrated, can be carried in a ship's double bottom—a space in steam-propelled vessels heretofore utilized only for water ballast.—The increased capacity incident to Diesel-engined ships is variously estimated by writers on the subject as from 5 to 10 per cent on the

Resume—Pacific Coast.

Typical new American ship with Diesel engines, American crew, American wages, and American standard of food, versus typical existing foreign competitor with average efficiency of steam propulsion, Asiatic crew, cheap wages, and poor food, both vessels making five round trips a year between the west coast of the United States and the west coast of South America, a distance of about 5,000 miles:

Increased annual cost for American ship:
Wages of 44 officers and men....\$12,720
Food at 50 cents per day instead
of 20 cents 4,752

\$17,472

Decreased annual cost for American ship:
Saving in cost of oil fuel over coal 18,644

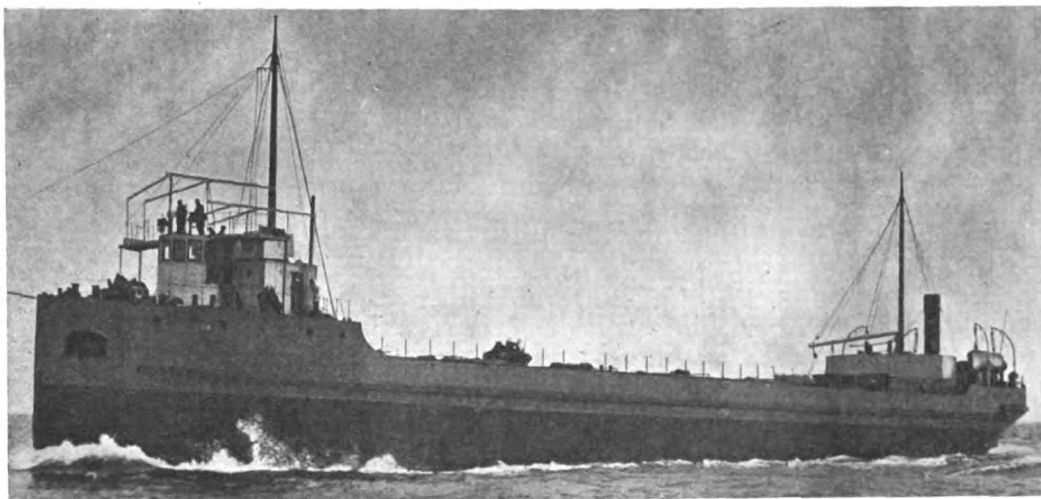
Net annual saving for American ship 1,172

Annual increase in earning capacity of American ship from 400 tons additional freight space 32,000

Operating returns in favor of American ship, per annum\$33,172

Atlantic Coast.

For the typical bulk carrier on the Atlantic



MOTORSHIP "CALGARY"

Built by Swan, Hunter & Wigham Richardson some years ago for service on the Great Lakes for a Canadian firm. She has quite recently been purchased by the Standard Oil. However, she should not be regarded as a typical example of a successful motorship, as she is underpowered. The "Calgary" is driven by two 260 b. h. p. Polar-Diesel engines of the two-cycle type, constructed in Sweden, and she crossed under her own power in September, 1912

coast the conditions are somewhat different from those on the Pacific coast, as follows:

(1) The difference in cost of crews was less, as competitive vessels in these waters do not operate with Asiatic crews, and their standard of food is higher than for Asiatic crews.

The American scale of wages for officers and crew can be taken as the same as those for corresponding vessels on the Pacific coast; but for foreign competitors with Caucasian crews on the Atlantic coast the average wage scale for the typical freighter will be approximately \$1,500.00 per month (\$18,000 per annum). Food cost 30 cents per day at least.

(2) Coal being more plentiful and the various seaports nearer to the mines, the cost is less than on the Pacific coast. The ports on the North Atlantic particularly are farther removed from the oil wells and in consequence the average cost of oil is higher than on the Pacific coast.

The average cost of coal at various Atlantic ports will be \$4.00 per ton, while the average cost of fuel oil should be taken at \$8.75 per ton, a price somewhat above the normal average.

The average length of voyage will be assumed the same as from San Francisco to Valparaiso (5,140 miles) as the distance from New York to Rio de Janeiro is 4,441 miles, and from New York to Montevideo is 5,497 miles. The freight rates are approximately the same as those on the Pacific coast, and for purposes of comparison we will assume it to be an average of only \$8 per ton, weight or measurement freight.

Applying these modifications for the Atlantic coast to the typical freighter assumed we would have the following:

Resume—Atlantic Coast.

Typical new American ship with Diesel engines, American crew, American wages, and American standard of food versus typical existing foreign competitor with average efficiency of steam propulsion, European crew, fair wages, and fair food, both vessels making five round trips a year between the east coast of the United States and the east coast of South America, a distance of 5,000 miles.

Increased annual cost for American ship:	
Wages for 44 officers and men....	\$8,520
Food at 50 cents per day instead of 30 cents	3,204
	\$11,724
Decreased annual cost for American ship:	
Saving in cost of oil fuel over coal....	7,672
	4,052
Net annual loss for American ship....	
	32,000
Annual increase in earning capacity of American ship from 400 tons additional freight space	
	\$27,948
Operating returns in favor of American ship, per annum	
	\$27,948

Ships for Passengers and Freight.

As has been stated, the larger number of the proposed naval auxiliary fleet will naturally be freight carriers, and consequently of slow and economical speed. While the internal-combustion engine is peculiarly adapted to this class of

merchant vessel, there are limitations to the size of this engine. Under existing conditions it would be impracticable to use internal-combustion engines of above 5,000 horsepower (twin-screw). [This statement is perfectly accurate—Editor] and the use of the Diesel engine is therefore practically limited to slow freight ships of not exceeding 5,000 gross tons.

[Editor's Note.—Here it may be said that the East Asiatic company already have in service eight or nine motorships each of 5,295 gross tons, so that 5,000 gross tons evidently is not the maximum. However, Capt. McAllister evidently overlooked that the conditions between a motorship and a steamship are quite different and that gross tonnage of a motorship is not the correct standard of use. He should have used "displacement" as his standard term, because it is the "displacement" of a ship that effects the power, and the size of a motorship is limited by its power—not by its gross tonnage. The maximum for the successful motorship of the next four or five years will be 15,000 tons displacement; but the majority will not exceed 10,000 tons displacement, or about 8,000 dead-weight-capacity. In this connection it may be said that the U. S. Navy built Diesel-driven tanker "Maumee" is of 15,000 tons displacement, and 5,000 b. h. p. (equivalent to 6,000 i. h. p. steam). She, however, is a little in advance of her time, so some trouble with her machinery may be expected, particularly as when the designers got out the engine drawings they had not installed an engine of high power in a large mercantile ship.]

UNION GAS ENGINE COMPANY WILL BUILD DIESELS.

The latest San Francisco house to take up the manufacture of heavy-oil engines is the Union Gas Engine company, which was one of the first concerns in the country to bring the gasoline engine to a position of commercial practicability, and whose products have been favorably known throughout the Coast territory and in several foreign countries for about thirty years. This company is known as the originator of some of the most useful ideas in gas engine manufacture, and as the builder of some of the largest marine

gas engines in use. The company's sales organization now effectively covers the entire Pacific Coast of North America, and extends into the principal markets of the Antipodes.

The announcement, a few months ago, that the Union Gas Engine company had secured the Coast agency for the Craig Diesel engine was received with no little interest. While the Craig product was comparatively little known in this territory, it was appreciated that the Union company would not take up an engine of this kind without the fullest investigation and assurance that the article would work out satisfactorily in every way under Coast conditions. The James Craig Engine & Machine Works has in fact been prominent in the gas engine business on the East Coast for some eighteen years, having a large and finely equipped plant at Jersey City, and the first of this year, after about six years of investigation and experiment, the company brought out a well-perfected line of heavy-oil engines, which had been thoroughly tested in experimental installations. Thus, while it has been on the market but a short time, the Craig Diesel has given practical demonstration of its value; and the special features involved are finding great favor with internal combustion experts.

The Craig Diesel engine is built on the 4-cycle principle, and is directly reversible, compressed air being used for starting and reversing, and for the injection of fuel. The arrangement of fuel valves, etc., permits a wide range of speed and easy control; and all control mechanism is easily manipulated from one position. Valve action in cylinder heads, etc., is so arranged that the heads can be removed without interfering with adjustments. A highly desirable feature, also, is the fact that these engines are designed to run with a minimum of noise. The Craig engines will handle practically any grade of oil, and consumes not over ½ lb. per h. p. per hour. The large engines run up to 1,000 h. p., with 6 to 8 cylinders.

The high standing of the Union organization, together with the attractive features of the new engines, have brought an immediate response from Coast buyers; and at present the demand is outstripping the manufacturing facilities. Owing to the rush of work in the East, it has been found impossible to get deliveries as promptly as desired from the Jersey City plant, and the Union company is now preparing to help out by building Diesel engines on the Craig design in its Oakland shops. To that end W. L. Corson, chief engineer of the Union Gas Engine company, left for the East about the middle of September, and will visit the Craig plant, as well as various manufacturing centers throughout the country. Besides looking for new ideas in factory management, he expects to bring with him on his return all necessary plans and patterns for the Craig heavy-oil engines. O. H. Fischer, president of the Union Gas Engine company, states that there is an enormous business in sight for the new line, and that some increase will probably be required in the plant to provide for its production, though the precise nature of the additions has not yet been determined.

A SWIFT MESSENGER BOAT.

The fast messenger boat Ajax, built by G. W. Kneass for the Union Iron Works, Frisco, with a length of 40 ft., beam of 6½ ft., and an 8-cylinder 220 h. p. Van Blerck engine, was given a trial September 22, and made a speed of 28 miles an hour.



MOTORSHIP "PANAMA"

Lessons From European Experiences With Motors and Ships

DISCRIMINATION NECESSARY WHEN ORDERING MOTORSHIPS.

(Contributed)

[Editor's Foreword.—We are no partisans, or "boosters," of any particular cycle or make of motor; but we publish the following in the anticipation that some one with authoritative information will come forward with other details of the ships referred to, as there always are two sides to every question and certainly shipowners should be enlightened as to the real truth of ships that apparently have not given ideal service. At the same time there is no maxim more true than, "One always pays to learn." In this country there are many domestic-built engines being developed that shipowners should encourage, even though success always may not be obtained at the start. But vessels ordered under such conditions should be regarded purely as experiments and if one, or two, installations of new domestic oil engines fail to render proper service the entire motorship industry should not be damned as a consequence. In the case in question the British shipowners evidently patriotically supported a budding home industry, instead of going to the continent of Europe and placing orders with firms with more experience in that particular branch of the marine industry. Where they seem to have made a mistake, however, was in not making it public that an experiment was being made.]

No one will deny that a small percentage of the large European motorships were practically failures; but almost every such case reveals lack of proper initial discrimination on the part of the owners, and lack of experience of the builders and designs. A typical instance is that of the Flower Motorship Co., of England, formed by the Samuel interests several years ago, and who

replaced with Diesels of another type and make.

Previous to building the "Arum & Arabis" Swan, Hunter & Wigham Richardson constructed and engined the twin-screw 500 h. p. Diesel-ship Toiler, and this vessel too had her motors replaced with steam, and this chiefly formed their experience. Curiously enough all these ships, namely the "Abelia, Arum, Arabis, Toiler & Sebastian" had two-cycle type Diesel engines installed.

Surely it is better to make this clear and stop others from falling blindfold into pitfalls, and thus damning the big motorship in this country. For, there can be no doubt that the results of these five, and other two-cycle engined ships, nearly killed the motorship movement in Great Britain. Let ship owners do their utmost to develop both Diesel cycles; but they must do it with open eyes.

As it was, the accounts of the Flower Motorship Co., at the end of 1915, showed a capital of £174,485, and sundry creditors totalling £12,742; the assets being represented by £65,000 due for the loss of the "Abelia" and £117,244, for which the builders of the "Arum & Arabis" were responsible. Thus instead of paying huge dividends like other shipowners only 5% was paid.

Now as these financial reports were published all American shipowners know that here is a case where a fleet of motorships were not a financial success for all concerned, and form their opinions

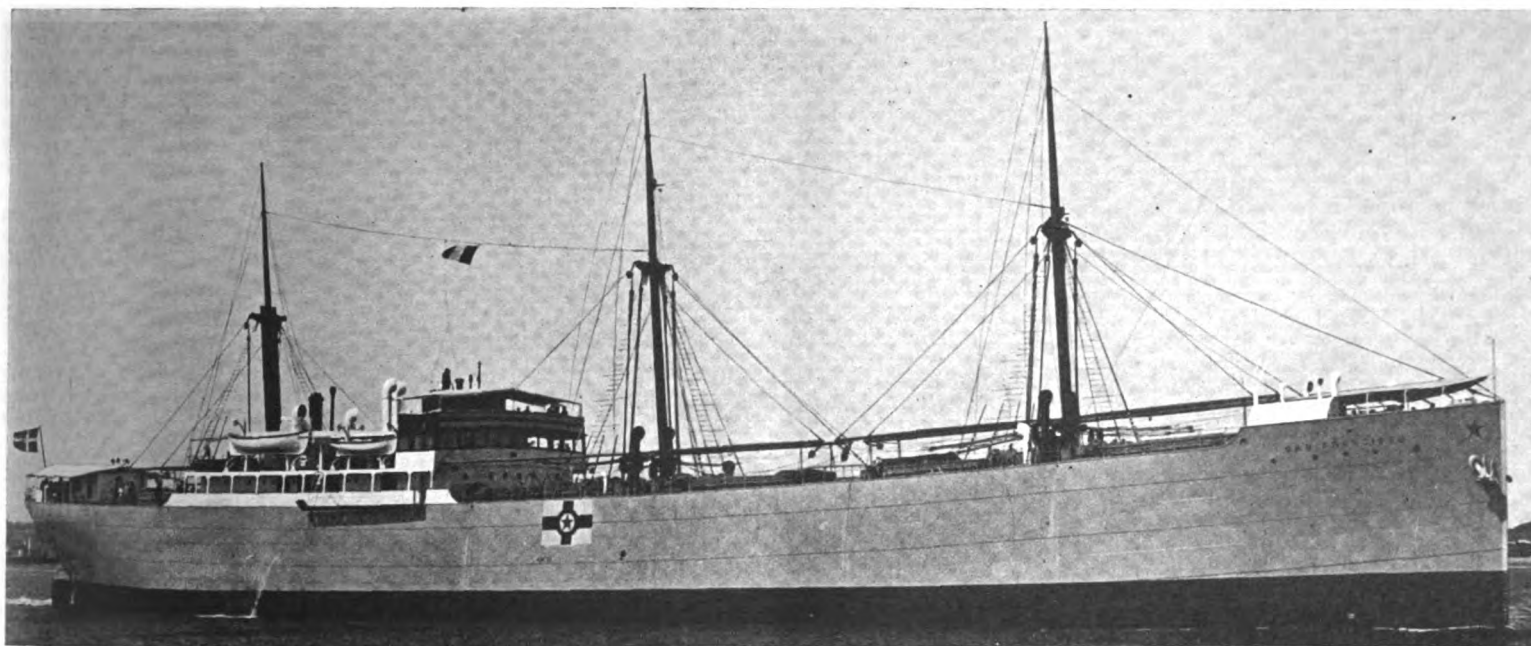
SIDELIGHTS ON THE MARINE DIESEL ENGINE DEVELOPMENT IN EUROPE.

(Contributed)

Editor's Note: The communication reproduced below has been handed in by a subscriber who has followed the Diesel engine development closely both in this and foreign countries. Its publication does not imply verification by this journal, nor reflection on any of the firms mentioned, but nevertheless the statements therein are worthy of consideration and independent investigation by parties contemplating investing money either in the manufacture or the purchase of Diesel engines. A great deal of mystery has surrounded the Diesel engine business in the past which may be to a large extent responsible for some of the losses which have been incurred up to this time. "Motorship" believes that more definite progress may be made in future by a fuller presentation of all information relating to an industry which has such abundant promise.

Now that the works of the Carels of Ghent, Belgium, are in the hands of the Germans, and the Maschinenfabrik-Augsburg-Nürnberg, of Nuremberg, Germany, are practically cut off from the rest of the world, it will do no harm to them to reveal that about half-a-dozen years ago some very clever salesmanship on their part, (assisted by the sudden craze among great European engineers to rush headlong into marine Diesel engine construction without proper thought or discrimination) secured them many licensees before they had much to offer.

At that time neither of these two concerns had installed a mercantile marine Diesel oil engine of over 500 h. p. in a ship, although they had



MOTORSHIP "SAN FRANCISCO"

commenced operations with the Abelia, Arum & Arabis. The first named was built by Armstrong, Whitworth & Co., who previously had had no experience with large sea-going motorships. Unfortunately she was sunk by a German submarine in the North Sea, on December 30th last.

The other two were built by Swan, Hunter & Wigham Richardson, who are marine engineers and shipbuilders of the highest repute, yet their lack of extensive sea-going Diesel experience cost them heavily, for the Arum & Arabis gave so much trouble that the Flower Motorship Co., returned these two ships to them and the builders agreed to operate them and pay 5 per cent per annum on their cost to the owners.

Both the owners and builders were to blame for the bad impression that these vessels gave to the marine Diesel engine industry and to the Motorship movement in general, as both apparently showed absence of proper discrimination and put too much faith in the builder's splendid reputation as steamship constructors.

Now Swan, Hunter and Wigham Richardson, acquired a constructional-license from a firm that had built no Diesel engines for large mercantile ships, although it may be said to the credit of the firm who granted the license that they had Diesel-engined with good results, quite a considerable number of coasting motor craft, ranging from 60 to 400 h. p.

About the same time as their licensees built the Arum & Arabis this latter mentioned firm equipped a big ship (the Sebastian), with Diesels, only to have them removed within a year, and

accordingly. Hence, is it not better to acquaint them with the real facts of the case, so that they will not condemn motorships as a whole. Let it be borne in mind that there are twenty times as many successful motorships as there are failures, and that no shipowner need be saddled with a bad ship if he will take trouble to make proper investigations and uses discrimination. Successful marine Diesel engines are not produced by "hopes," but by experience and perseverance. Unfortunately only a few of the oil companies are doing their just share of accepting the burden of these experiments. Apparently they desire all the benefits without any of the attendant risks.

EXCLUSIVE INFORMATION IN MOTORSHIP.

From month to month there appears in MOTORSHIP in detailed form authentic data on the design, construction and operation of commercial and naval motor vessels and internal combustion engines.

A current record of experimentation and practice in motorships, submersibles, auxiliaries, etc.; Diesel engines, surface ignition engines, etc., will be invaluable to you and, in fact, the bound volumes of MOTORSHIP will be among the most frequently consulted in your library.

Information of this character is gathered for MOTORSHIP exclusively by special correspondents in the foreign and domestic centers. MOTORSHIP is INTERNATIONAL in character.

considerable stationary Diesel experience. Yet the following great engineering and shipbuilding firms acquired licenses from them, and in several cases actually built high-powered Diesel-driven ships from their designs and drawings. The ultimate results nearly spilt the entire motorship business.

Carels, of Ghent, successfully placed licenses with Messrs. L. B. Vickers, England; Messrs. Richardsons-Westgarth, Middlesborough, England; Clyde Shipbuilding & Engineering Co., Glasgow, Scotland; Alex. Stephen & Sons, Glasgow, Scotland; Palmers Shipbuilding & Iron Co., Hebburn-on-tyne, England; Consolidated Diesel Engine Mfgs., Ltd., Ipswich, England; John I. Thornycroft & Co., Southampton, England; Schneider & Cie, Le Creusot, France; Reiherstieg Schiffswerft und Maschinenfabrik, Hamburg, Germany; Joh. C. Tecklenborg, A. G. Schiffswerft und Maschinenfabrik, Bremerhaven-Gretemunde, Germany.

The license placed with the Consolidated Diesel Engine Mfgs. resulted in the greatest farce, because the original capital of \$3,500,000 (three-and-a-half-million-dollars) was swallowed up in a year and the company was wound-up. Their new works were purchased about two years ago by Vickers for building submarine engines.

The Nürnberg Works of the Maschinenfabrik-Augsburg-Nürnberg granted licenses to Harland & Wolff, Belfast, Ireland; Fairfield Shipbuilding & Engineering Co., Scotland; Sir W. G. Armstrong, Whitworth & Co., Jarrow, England; Cammell, Laird & Co., Ltd., Scotland; J. Samuel



MOTORSHIP "CHILE"

White & Co., Cowes, England; Yarrow & Co., Glasgow, Scotland; Babcock & Wilcox, London, England.

It is said neither of these great firms were enabled to build any other make of two or four cycle Diesel engines under the terms of their license. Yarrow's built a couple of experimental two-cylinder Nürnberg design engines, and the result caused them to place orders with the Burneister and Wain Oil Engine Co., of Glasgow, for several 1,000 four-cycle-type Diesel engines, to drive the cruising shafts of some torpedo-boat-destroyers then building for Japan.

J. S. White & Co. built several Nürnberg design of two-cycle Diesel engines, and then abandoned the design in favor of the Brons semi-Diesel type oil engine, which the terms of their license did not prevent them building.

Harland & Wolff consequently closely associated themselves with the Burneister & Wain Co., of Glasgow, who afterwards built the engines for Harland & Wolff-built ships.

J. I. Thornycroft & Co. purchased a Diesel license from the Diesel Engine Co., who were associated with Carel, of Ghent. They received an order from the British Admiralty for a 1,000 h. p. engine for the torpedo boat destroyer Hardy. When last the writer was at Thornycroft's works, he saw the first and only cylinder built for this engine, lying about in the yard, apparently on the scrap heap. Needless to say that 1,000 two-cycle engine was never installed in the Hardy. Thornycroft's also built a 200 h. p. Diesel engine for Job Bros., of New York and Liverpool, for their schooner Netherton, and two of 200 h. p. for Senor Leloir's yacht Atair. In each case the engines were thrown back on their hands.

All this would seem to show that great caution and proper investigation is needed before building Diesel engines, and before adopting a license assure that the granter of the license has had success at sea with his engines.

The Looker-on.

LIBBY, McNEILL & LIBBY ACQUIRE LARGE FLEET.

Apart from the new four-masted auxiliary schooner now being constructed at the yards of Standifer & Clarkson of Portland, Ore., the above company has acquired the entire fleet formerly operated by the North Alaska Salmon company, which runs into a considerable tonnage, and includes the following well-known vessels:

Full rigged sailing ship "Oriental," four masted barque "Olympic," three masted sailing ships "George Curtis" and "Standard," the four masted fore and aft schooner "Henry Wilson," schooner rigged motor ship "Expansion," powered with twin 65 h. p. Atlas engines; "George F. Haller," twin screw steam cannery tender. Also the following motor cannery tenders:

"Bonito," "Pride of Alaska," "Triumph," "May," "St. Elias," "Caesar" (roustabout).

In referring to the order for the new auxiliary schooner in our September issue it is incorrectly stated that the plans and engines for this vessel are being contracted for by the Skandia Engineering company; this should only apply in so far as building the Skandia Diesel engines. C. J. Carlson, who is responsible for the design of this schooner, is the marine superintendent of the Libby, McNeill & Libby company and who also has prepared previous designs from which their

vessels have been built. Mr. Carlson received his training under such well-known builders as H. D. Bendixsen of Eureka and the Hall Bros. of Port Blakely.

ASTORIA MOTORSHIPS RAPIDLY NEARING COMPLETION

The busiest motorship yard in the United States today is that the McEachern-Standifer-Clarkson Ship company at Astoria, where five 266-foot vessels are under construction side by side.

The first three vessels are built by this company on its own account and will be sold or chartered as the circumstances warrant. These boats were designed by the Skandia Engineering company of Seattle and are 266x43x22 and will each be powered with two 320 b. h. p. Skandia engines. Vessel No. 1 is 75 per cent complete and will be launched between October 15 and 30. No. 2 is 60 per cent complete and will be launched in 90 days. No. 3 is 50 per cent complete and will go into the water in about four months.

The first pair of engines will be delivered October 1 and the other two sets November 1 and December 1.

The other two vessels, which will be equipped with Bolinders motors, are being built for O. A. Anderson & company. No. 4 is 30 per cent complete and is due for launching in about five months, while No. 5 is 10 per cent advanced.

As soon as the ways are clear two additional vessels will be laid down and possibly more if the conditions at that time warrant it. Mr. J. A. McEachern, who is personally superintending the work, is considering putting in another way to facilitate getting the next vessel started.

The plant is located on a 20-acre site and is in an admirable position to receive a good supply of raw material and keep costs down. About 225 hands are employed. The layout is a thoroughly modern one, electricity and compressed air being used exclusively.

MOTOR VESSELS MAY BE ADOPTED FOR COAST SURVEY.

Dr. E. Lester Jones, chief of the U. S. Coast and Geodetic Survey, who visited the Pacific Coast during the latter part of September, announced his intention to give instructions on his return to Washington to have a thorough comparison made by members of his staff of the Diesel vs. the steam engine, for the purpose of determining which shall be adopted in the two new vessels which are shortly to be constructed for the Coast survey work.

"I am determined to make the branch of the service with which I have been entrusted as efficient and yet as economical as possible, and if the adoption of internal combustion engines in our vessels be found a substantial saving, as well as practical under the widely diverse conditions of their operation, I will certainly specify their installation over steam. The question is one, however, that must be first passed upon by the government experts."

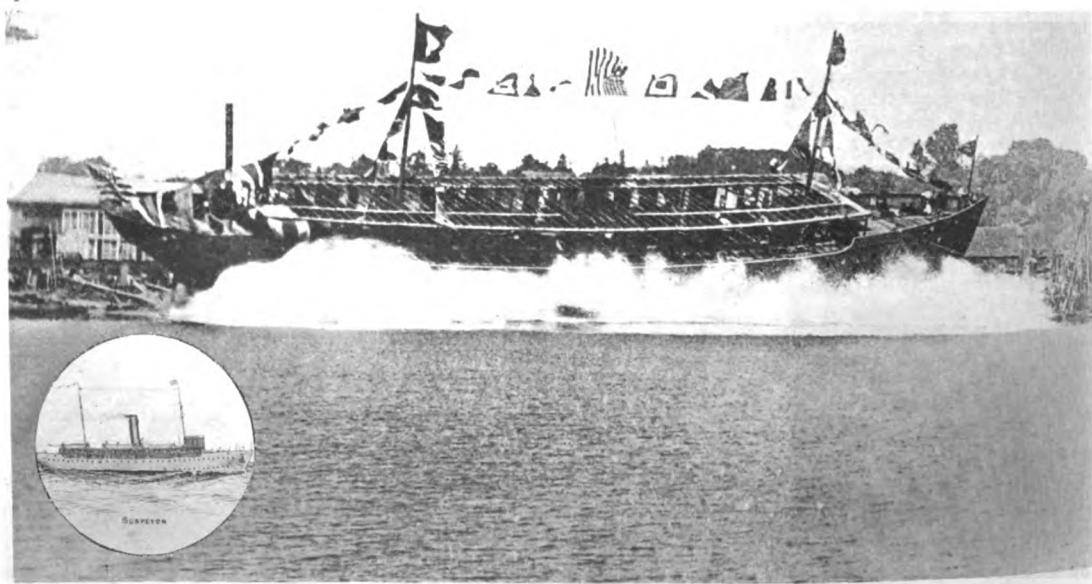
Dr. Jones made a personal examination of Puget Sound waters in the launch of the Washington State Fish Commission. He has ordered additional surveys made of certain portions of the Sound, and particularly that special charts be at once prepared for Lakes Washington and Union, which will be accessible shortly through the recently completed canal.

The "Surveyor," launched in June last at Manitowoc, Wis., will, according to Dr. Jones, arrive on Puget Sound next January. She is a steel steam vessel, 186 ft., beam 34 ft., with draft of 12 ft. In reply to an inquiry as to why the government should build a vessel for this Coast on the Great Lakes, Dr. Jones said it was solely a question of cost, the Manitowoc Shipbuilding & Dry Dock company having made an especially low bid in order to keep their yards busy.

The "Surveyor" will be the first modern vessel that the Pacific Coast has yet seen in the Coast and Geodetic service, as the ships now in use are antiquated and have been condemned. The government would not permit private individuals to operate such decrepit craft.

GRAY JOINS SKANDIA.

Wm. J. Gray, formerly San Francisco representative of the Mietz & Weiss people, has joined the staff of J. H. Hansen & company and is assisting in the supervision of plans for the manufacture of the Skandia engine in San Francisco.



COAST AND GEODETIC VESSEL "SURVEYOR"

Built for service on the Pacific Coast at the yards of the Manitowoc Shipbuilding Co., Manitowoc, Wis.

WRECK OF THE "GREAT BEAR."

Upper left: On the rocks. Upper right: Crew rescuing the owner, John Borden, from the surf. At bottom: Power dory which saved all hands. Pinnacle Rock in distance



LOSS OF "GREAT BEAR."

The auxiliary schooner "Great Bear" was lost in the Bering Sea August 10. This vessel was constructed on the Pacific Coast to the order of John Borden of Chicago, at a cost of \$63,000, who, together with Capt. Louis Lane, the explorer, and a number of guests, had started upon a long voyage for the purpose of scientific research exploration and sport in the Arctic.

She left Seattle July 25 and when sixteen days out, at 12:55 a. m., struck on Pinnacle Rock in Bering Sea. The crew took refuge by means of their power dory and whaleboats upon St. Matthews Island, which lies eight miles distant from Pinnacle Rock and were rescued fifteen days later by the coast guard cutter "McCulloch." The auxiliary motive power of the "Great Bear" consisted of a 160 b. h. p. Bolinder Diesel engine which had worked perfectly from the date of departure to the hour of the disaster.

The engine being new was kept well within her rated horsepower revolutions of 225 r. p. m. and at 200-208 r. p. m. drove the vessel a constant speed of $7\frac{1}{4}$ knots. With whole sail breeze and all lower canvas set, and the engine held down to 220 r. p. m. the vessel logged close to ten knots per hour.

It is understood that a further attempt will be made next year by Mr. Borden with a new vessel. One of the many courageous acts performed during this disaster is well worth remembering.

Prior to leaving for the North, Mr. Borden had been presented with a beautiful mahogany dory in which he installed a 5 h. p. Scripps motor. This little vessel at the time of the wreck saved the lives of the entire ship's company, and when a few days afterwards she was being swamped by a heavy sea whilst lying at anchor off St. Matthews Island, John Borden after first trying to reach her in a whaleboat risked his life by

swimming to her and cutting the anchor warp, thus enabling the little vessel to be driven ashore by the sea and wind and hauled high and dry to safety by many ready hands in gratitude. The heavy breaking icy sea and undertow was not so easy for the rescuer who lost hold of the dory and Davy Jones very nearly claimed John Borden for one of his own.

PORTLAND SHIPYARD SECURES LARGE ORDER.

The Heath Shipbuilding company of Portland, Ore., has contracted with the Pacific Motorship company of Christiania, Norway, through Einar Beyer of Seattle, representing Joachim Greig, shipbroker, Bergen, Norway, to build and engine six large wooden auxiliary schooners the total cost for which will exceed \$1,500,000, all to be delivered within nineteen months.

The Heath Shipbuilding company will build in addition two motorships to be owned and operated by a Pacific Coast company.

The six vessels mentioned are to be five-masted (topmast) fore-and-aft wooden double deckers, of 270 ft. o. a. length, 46 ft. beam, and 25 ft. moulded depth. They are to be powered with twin sets of 240 b. h. p. Scandia semi-Diesel engines aggregating 480-500 b. h. p. The first keel is to be laid in November and the first vessel delivered in ten months. The second in eleven months and one every sixty days following.

Dredging and filling in will occupy three weeks working day and night at the company's plant at Portland, when four building berths will be constructed, an overhead shelter to be provided at berth No. 1, where the first keel will be laid November 15.

George E. Hardy, late secretary to the Portland Chamber of Commerce, has accomplished all this within a few weeks and in the face of discouragement.

In an interview with a representative of Motorship, September 23, Mr. Hardy said:

"When I started out to gather capital for erecting a shipyard and ships I ran up against some of the most extraordinary excuses and discouraging criticism that a man could listen to. The majority being blind or asleep to the fact that if we had ships with which to carry our products to the markets of the world our lumber mills could be running full time and at a better price for their output.

"So much shortsightedness was exhibited that I was on the point of giving up Oregon as hopeless and trying Seattle and Astoria. After three weeks of the hardest work I however sold \$20,000 worth of stock and of this amount two people took 50 per cent.

"What I cannot figure out is why the people of this Coast are so blind as not to see that every shipyard is becoming filled up with foreign orders. Norwegian capital, not in thousands, but millions, is being invested in shipbuilding on the Pacific Coast both in steel steamers and wooden auxiliaries and our own people are content to sit down and watch foreign capital take their birthright from under their very nose.

"I am now going to organize another company which will be known as the Oregon Navigation company and which will own and operate the two motorships to be built by the Heath Shipbuilding company.

"The vessels will be of the same rough dimensions as the Norwegian auxiliary schooners but be straight motorships having twin sets of 500 b. h. p. Diesels aggregating 1,000 b. h. p. and giving them a speed of about $9\frac{1}{2}$ knots.

"I am bringing a practical man from Norway, a Capt. S. Rangen, who for years has been successful as a commander, owner and operator, and incidentally J. Fred Larsen of Portland, is to have a prominent position on the board of directors."

Performance of the "City of Portland"

San Francisco, Sept. 23, 1916.

Now that the new motorship "City of Portland," of Charles R. McCormick & Co., has covered the first part of her initial deep sea voyage, the details of her performance will be of the highest interest to Pacific Coast shipowners, as giving a practical demonstration of the work of a large vessel built and operated under Pacific Coast conditions. As the largest of the heavy-oil auxiliary type so far completed in this district, her behavior should give a good indication of what may be expected of the numerous other vessels of the same type which will soon make their appearance. Aside from the fact that this is the largest Bolinder installation yet made here, her trip is of interest as being the first made by a Bolinder-engined freighter with engineers inexperienced in oil-engine operation, unaccompanied by a Swedish expert. The details of her performance now available should be complete enough to show what she will do in the future; and the results, though perhaps falling short of perfection, have been more than satisfactory in practically all details. The engines have had a thorough test; and in speed and power, fuel economy, simplicity and ease of control, and reliability, they have fulfilled expectations in every way.

The "City of Portland" is a five-masted schooner with twin 320 h. p. Bolinder engines as auxiliary. She has a length of 250 ft. between perpendiculars, or 278 ft. over all, having the regular head-sails of the windjammer; with a beam of 48 ft. and a hold 19 ft. deep. Her framing and general construction are along lines which have been fairly conventionalized for the Pacific Coast lumber trade, and she will carry something over 2,000,000 ft. of lumber, including the deckload.

On leaving the builders' yard at St. Helens, Ore., July 16, she was given a trial spin 21 miles up the river to Olton, where she took on fuel oil, and back to St. Helens. During the trial, as well as on the run down the coast to San Francisco lightship on her first voyage, a careful record of her performance was kept by W. R. Hewitt, consulting engineer, who is looking after the engine installations for Chas. R. McCormick & Co. On the trial she carried 350,000 ft. of lumber in the hold, and drew 11 ft. 5 in. of water forward, 14 ft. 2 in. aft on the trip up. The river current was estimated at 5 m. p. h. The engines, designed to run at about 220 r. p. m., made 203 r. p. m. on the trip up, giving the boat an average speed of 6½ miles per hour. At Olton she took on 1,035 bbls. of oil at 63 degrees, which brought her down by the stern to a draft of 16 ft., reducing the draft forward to 10 ft. 7 in. The distance covered on the down trip was 20 miles, and, with the engines turning at 204 r. p. m., the average speed was 10 m. p. m., making the average for the trial trip 8½ m. p. h. During the whole trip the engines worked very well and without serious complaint.

The "City of Portland" then proceeded to complete her cargo of slightly over 2,000,000 ft. of dimension timber for Port Pirie, Australia; and when loaded drew 21 ft. 3 in. forward, and 5 in. more aft. On August 1 she made another trip up to Olton, taking in sufficient fuel to carry her to Australia; and coming down to St. Helens on the morning of the 2nd, she again made 10 m. p. h. Setting out on her first voyage, she left Astoria at 7 a. m., August 4, and arrived at the San Francisco lightship at 4 A. M., August 6, stopping to let off Mr. Hewitt, who made the trip down to observe her performance at sea, under regular working conditions.

On this short trip the vessel was tried out in various ways to determine her speed and general performances under different combinations of sail and engine power. With the engines at normal speed, 220 r. p. m., and favorable winds, she sometimes made even better than on the trip down the river, the maximum being 10½ knots on this trip. Mr. Hewitt desired especially to determine the speed at which the greatest fuel economy could be effected without great loss of speed, and found that she could be counted on for about 8½ knots on the average, or slightly over 200 miles per day, with the engines turning about 185 r. p. m., and a daily fuel consumption of 11 to 12 bbls. of oil. With such low fuel consumption, it would be possible to make her round trip on the oil in her tanks, which is an important item in the present stage of oil-engine navigation, as "bunker" oil facilities are not yet assured at Australian ports, or even at Honolulu. The engineer was accordingly instructed to hold the engines down to about this speed,

and while this was found to involve some slight disadvantages, as will be brought out later, the general result as shown by the records is highly satisfactory.

One notable feature involved in running the engines at low speed, which was very pleasing to the engineers, was the surplus of compressed air, which has been turned to account to run various auxiliary machinery, such as the bilge pumps, winches and oil pumps.

Another matter worth mentioning, which is especially gratifying to the crew working below-deck, and is indeed a very favorable feature of this type of engine, is the very moderate temperature prevailing in the engine room. While the engines run hotter at the low speed than at the normal rate, the temperature on the run down from Astoria averaged 85 degrees, and was never above 92, while 99 was the highest recorded even on reaching the tropics in the vicinity of Honolulu. As compared with engine-room temperatures on steam vessels, this is decidedly comfortable.

The trip from San Francisco lightship to Honolulu took 12 days and 15 hours, ending 7 p. m., August 19. Little help was received from the wind during this time, and frequently complete calm was encountered, so that the engines had to be depended on even more than was expected, but they were generally held down to comparatively low speed, maintaining a speed of seven to eight knots, with very little variation. The engines averaged 159 to 160 r. p. m., and the average fuel consumption on the Honolulu run was 15.8 bbls. for 24 hours, while the amount of lubricating oil required was greatly reduced.

In this connection figures taken from the daily records at various points on the trip may be of interest. On August 8, two days from San Francisco, 16 bbls. of fuel was used for the 24 hours. The amount of lubricating oil varied greatly from watch to watch, as one of the engineers was experimenting to determine how little could be used; one watch using as much as 18 qts. for 4 hours, and another as little as 9 qts. On August 11, the morning watches used 4, 12 and 14 qts.; the afternoon, 10, 10 and 15 qts.; and this was about an average day for oil consumption. The amount of lubricating oil used seemed excessive at first, but by the time Honolulu was reached it had been cut down from 3½ bbls. in three days, used when the installation was first completed, to 1 bbl. in three days. The oil was of course very carefully filtered.

The engines behaved splendidly until August 15, when the effect of long-continued running at low speed began to appear, requiring a general cleaning up. This is due to the low pressure and imperfect atomization of the oil, which causes imperfect combustion, with a slight discharge of smoke, and in time results in more or less carbon formation and heating of cylinder heads.

On August 12, in complete calm, she made 6½ knots at 160 r. p. m. On the 15th, after the engines had been running almost steadily, and most of the time at low speed, since August 1, the cylinder heads began to heat unduly for the first time, and on the next day it was decided to make the first stop and clean up. The starboard engine was then stopped at 5:10 a. m., August 16, and the heads were removed, bulbs cleaned, burners cleaned, etc., and all parts replaced and the engine started at 8:22, the time taken in overhauling being 3 hours and 12 minutes. All parts were given a thorough examination including air compressor valves, etc., and all were found to be in good condition, the pistons clean and getting oil.

The next day the port engine was taken down and cleaned, and with the experience gained the previous day, the entire operation was performed, clean burners installed, the engine set up and started again, in 2 hours and 30 minutes from the time it stopped. Aside from the slight carbon deposit, which was easily removed, everything about the engines was found to be in fine shape, and the engines were turned up to 200 r. p. m. for the run into Honolulu, making a speed of 8½ knots with the aid of a good breeze, on August 19, the day of arrival.

The "City of Portland" stopped at Honolulu until the afternoon of August 23, and was able to replenish its fuel supply to the extent of 230 bbls. secured from the government, which was a great favor on the part of the naval authorities, and is highly appreciated by the owners. This will, under normal conditions, give the vessel fuel enough to complete her round trip.

WHY AMERICANS DO NOT INVEST IN SHIPS.

It will be noted that the new shipping bill is "An act to establish a United States shipping board for the purpose of encouraging, developing and creating a naval auxiliary and naval reserve and a merchant marine to meet the requirements of the commerce of the United States with its territories and possessions and with foreign countries; to regulate carriers by water engaged in the foreign and interstate commerce of the United States; and for other purposes."

A careful reading of this bill in its entirety will bring before the reader at least some points which should be of value to shipping interests; for instance part of section 13 reads: "It (the board) shall investigate the legal status of mortgage loans on vessel property, with a view to means of improving the security of such loans and of encouraging investment in American shipping."

At the present time shipping security is of little or no value as an asset, where a holder of such wishes to obtain an advance against same. The ordinary banker will not look at it for the simple reason that it is in reality no security at all. Should the banker take a mortgage on the vessel, such mortgage would be subject to all claims for labor and material, wages, etc., even although incurred subsequent to the date of the mortgage, taking precedence of such mortgage.

The unfortunate owner of a vessel should be met with reverses which necessitate his having to meet a heavy expenditure is entirely at the mercy of his creditors and is often forced to sell out, or his vessel is seized and sold by the U. S. marshal for much under its normal value, for the simple reason that the vessel herself, owing to the present shipping laws, is not an asset of any negotiable value.

MOTORSHIP KUSKOKWIM RIVER MEETS FURTHER TROUBLE.

A full account of this vessel's troubles on her maiden trip to Kuskokwim river, Alaska, was presented in our September issue. After being drydocked at Seattle and fitted with new propellers, she took on a capacity cargo of freight and left again for Alaska August 26th, but got only as far as Cape Beale, B. C., when engine trouble arose, necessitating her return to Seattle, where her cargo was discharged and she was laid up for the winter.

The consignees have libelled the vessel for \$62,000 for non-delivery of freight to points along the Kuskokwim river.

The owner and manager, John Graham, announces that contrary to being discouraged by the unfortunate combination of accidents and ill adventure which have befallen the Kuskokwim he is planning to build another vessel.

SHIPBUILDING PLANT AT VANCOUVER, WASH.

Another wooden shipbuilding plant is planned for the Columbia river.

Articles of incorporation were filed at Vancouver, Sept. 23, for the Vancouver Shipbuilding company, capital stock being \$25,000.

James Feeney, one of the owners of the Feeney & Bremmer Iron Works at Tillamook and G. R. Percival, a Vancouver attorney, are the incorporators.

The company is said to have several sites under option at Vancouver and will build a plant capable of handling five Columbia river motor ships at a time.

It is expected that work will be under way within 30 days and that contracts for several vessels, said to be available shortly, will be secured.

C. L. CARELS NOW IN HOLLAND.

Motorship is in receipt of a communication from C. L. Carels, of Carels Freres, the famous Belgian builder of Diesel engines. The exigencies of the war have evidently made it necessary for the Carels to leave Ghent where their plant is located as Mr. Carels writes from Middelburg, Holland. Nordberg & Co. are the Carels' American licensees.

Skandia Engines Made in San Francisco

The intention recently announced by J. H. Hansen & Co. to manufacture Skandia surface-ignition fuel oil engines in San Francisco is being carried out without delay, and the rapidity with which the plans are being consummated shows that this company will be in a position to deliver engines in a large way by the time the present motorship building development reaches its height. The patterns and designs from which these engines will be built arrived in San Francisco about the first of September, and with them also arrived A. Johansson, an engineer from the Skandia plant in Sweden, who will take personal charge of the construction and installation of the engines on the Pacific Coast. Work is now nearing completion on the first of eight engines of 240 h. p. each, all arrangements for the construction of which have been made with local shops. Two of these engines are to be installed in a vessel being built at Hoquiam, Wash., for the E. K. Wood Lumber company; four are for two vessels being built at Astoria by the McEachern-Standifer-Clarkson Ship company; and two are for an auxiliary schooner to be built at Portland by the same people for Libby, McNeill & Libby.

These, the first Skandia engines to be built in the United States, are only a few of the large number for which orders have been placed by Pacific Coast firms, and several of which have recently arrived from the Swedish works for early installation. The first pair of the 240 h. p. size to arrive from the home factory reached San Francisco September 20, and were shipped immediately to Astoria for the first Skandia installation at the McEachern shipyard, which is to be completed early in October. Many other orders are now coming in for this and other sizes of Skandia engines, and manufacturing operations in San Francisco will be increased as rapidly as possible until the urgent demand can be met.

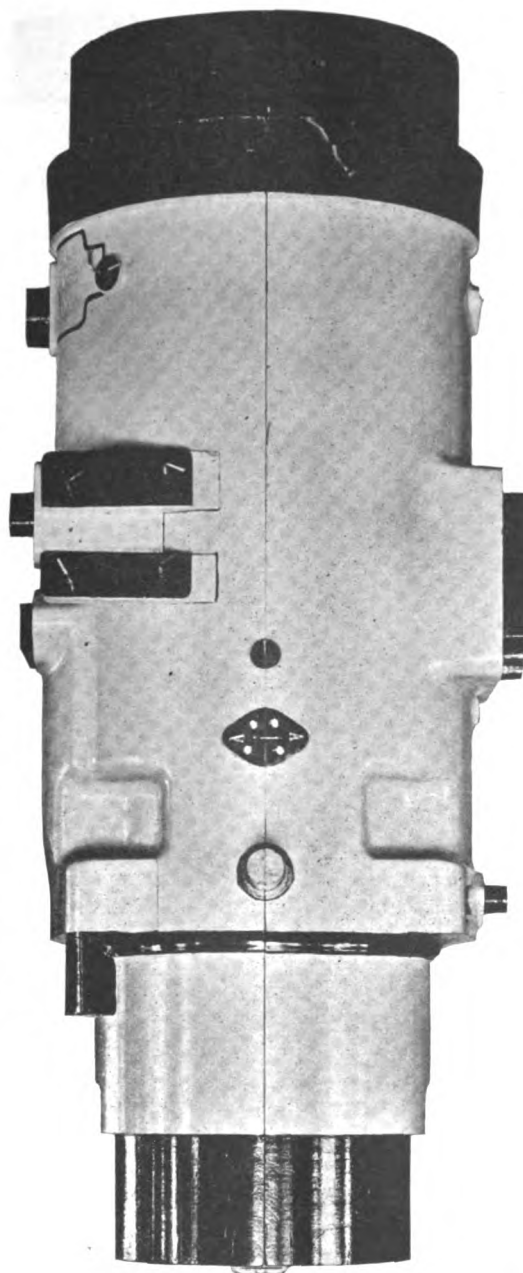
Skandia engines were little known on the Pacific Coast until about a year ago, when the agency was taken up by J. H. Hansen & Co., but they have long been an important factor in the maritime life of Sweden, and in fact of the entire region bordering on the North and Baltic seas, and have won an established position by use in

eminently qualified to handle a proposition of this kind. Of the two partners, Jafet Lindberg is well known in Pacific Coast business and financial circles, being president of the Pioneer Mining Company and largely interested in Alaska mining properties, and a director of the Scandinavian-American Bank of Seattle; and J. H. Hansen, who is in active management of the company's affairs, is a mechanical engineer of long experience and high standing, having been for some time associated with the Allis-Chalmers company of Milwaukee, builders of the heaviest types of power equipment, and for ten years in charge of the turbine construction department of the Pelton Water Wheel company of San Francisco. Foreseeing the unlimited possibilities of the heavy-oil engine on the Pacific Coast, and being acquainted with the record of the Skandia in other parts of the world, Messrs. Hansen and Lindberg secured the Pacific Coast agency last year. Since then they have placed the Skandia prominently before the shipping men of this territory, and its evident merits found considerable favor, even before it was possible to show an engine in actual performance.

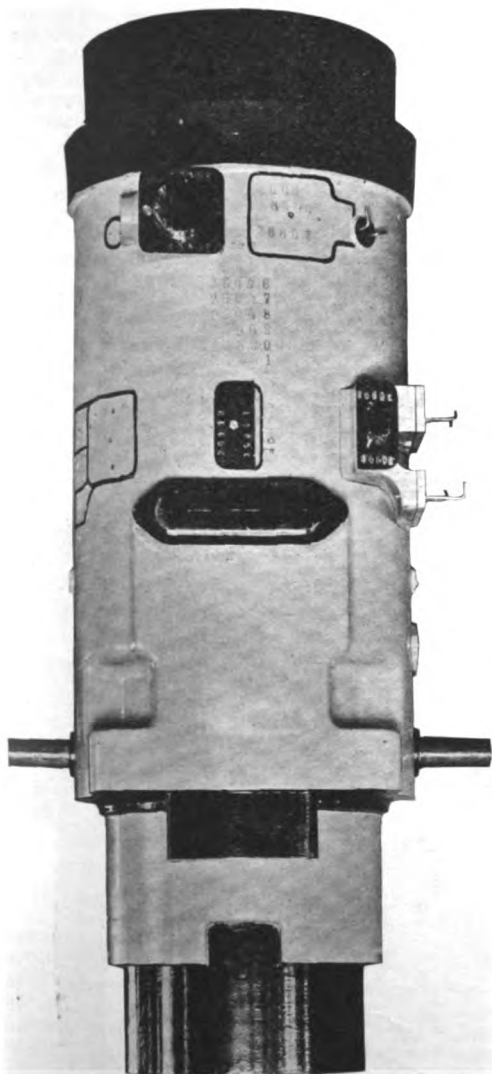
While missionary work was being done here, the Swedish factory became rushed with orders from its home territory and other parts of the world; and with tonnage scarce and ships irregular, it was found difficult to make deliveries as promptly as was desired on the Pacific Coast orders. Mr. Hansen accordingly made a trip East last spring in an effort to hasten deliveries, and the manufacturers were so impressed with the performance of the coast agents that they decided to enlarge their scope, giving to J. H. Hansen & Co. the exclusive agency for the entire United States, with manufacturing rights.

The arrangements now made for construction of the engines in San Francisco, supplementing such as can be brought from the home factory, will insure their prompt delivery to all Pacific Coast points, and will also enable Skandia users in this territory to obtain spare parts for any of the engines on short notice.

It will be noticed from the photos that no time has been lost in getting these engines built here,



ASSEMBLED PATTERN FOR CYLINDER OF 240 H. P. 4-CYLINDER SKANDIA. FRONT AT LEFT; BACK AT RIGHT. 6 FEET OVER ALL

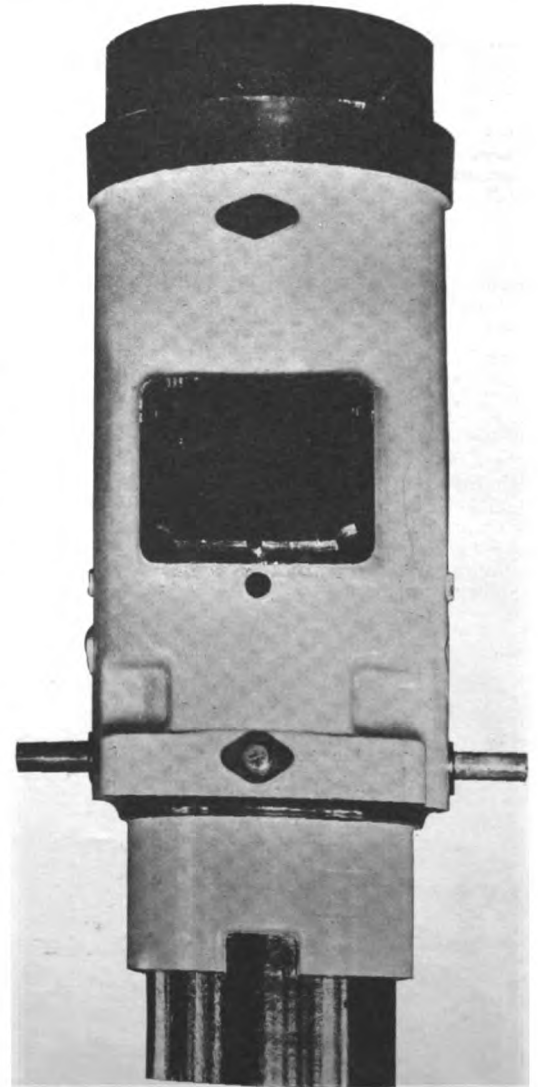


PATTERN FOR FRONT OF CYLINDER 240 H. P. SKANDIA

vessels all over the world. The original manufacturing concern, which developed the Skandia engine to its present state of perfection and has its products protected by patents in all nations of the world, is known as the Lysekils Mekaniska Verkstads A. B., and is located at Lysekil, Sweden. The company is controlled by L. Laurin, who first originated the engine of this particular design, and has been engaged in their manufacture for the last eighteen years, during which he has built up a remarkably efficient manufacturing organization and a large and well-equipped plant.

The Skandia engine is of the surface-ignition, hot-bulb type, and one of its distinctive features is the water-cooled combustion chamber, which insures its proper operation, whether against heavy or light loads, or with no load whatever. It is also directly reversible, reversing by the use of compressed air, which further tends to increase its reliability and scope of usefulness. The first engines built were of small horse-power, the original purpose of the designer being to meet the exacting requirements of the fishermen operating small boats off the Scandinavian coasts. Gaining immediate and widespread popularity in that direction, the same principles were applied to engines of an increasing range of sizes, until units were produced of all the way from five to five hundred h. p., in all of which the original qualities of reliability, simplicity, and adaptability to varying conditions, have been preserved, with the gradual addition of many refinements as the result of long experience. Up to the present time about 5,000 Skandia marine installations have been made, of a total power of 275,000 h. p.

The American agents, J. H. Hansen & Co., are



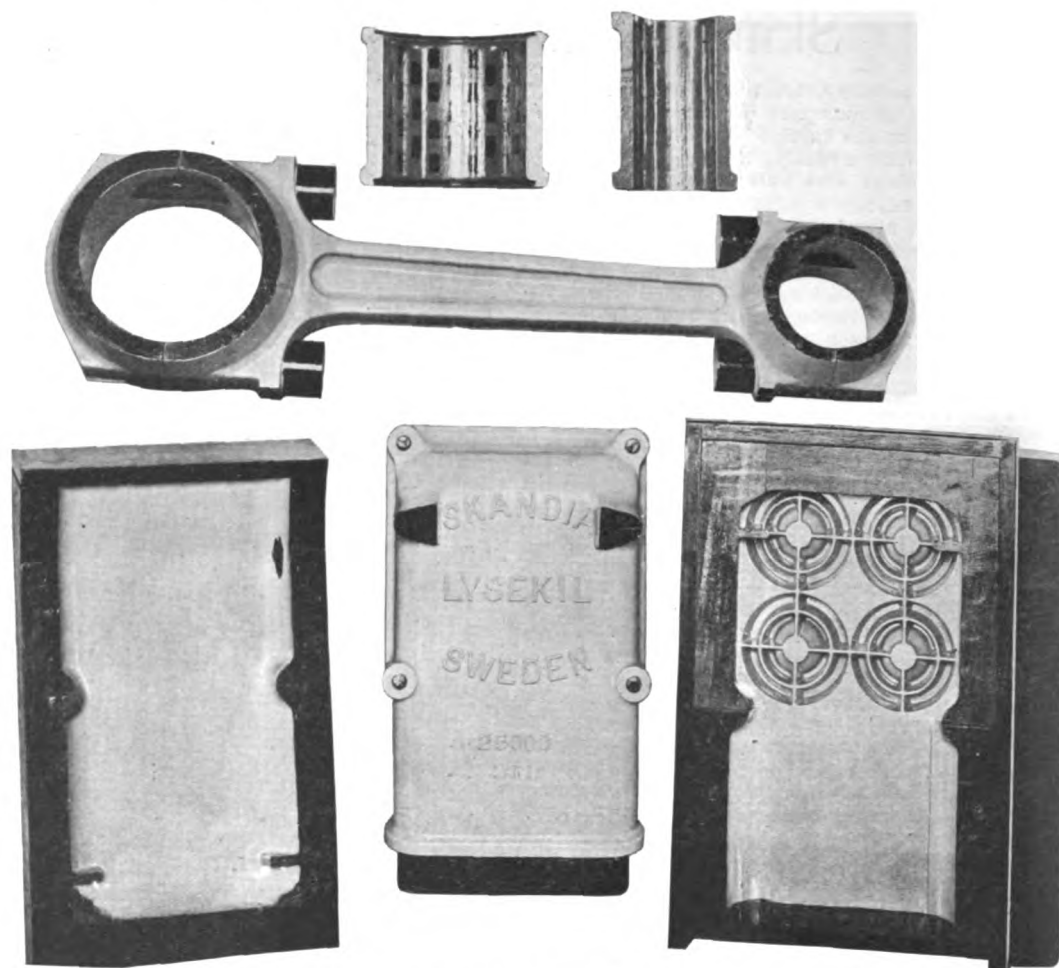
PATTERN FOR BACK OF CYLINDER 240 H. P. SKANDIA

and the first will be ready for installation in December. They are being built throughout to Lloyds' specifications, and are subjected at various stages to rigid inspection by Jos. B. Blackett, surveyor at San Francisco for Lloyds' Register of Shipping. Besides Mr. Johansson, who is supervising the construction, a force of expert mechanics from the Lysekil works has already arrived in San Francisco to assist in the manufacture and installation, assuring similar standards of workmanship and results as are obtained at the home plant. Some of these men have been with the company sixteen years, and have installed its engines in many parts of the world.

In placing the work of manufacture in local shops, the agents have chosen concerns of known reliability and high standards of workmanship, allotting the various portions to shops specializing on those particular classes of work. The patterns for cylinders, etc., have been placed in the foundry of McKay, Moore & Noble, at Seventeenth and Mississippi Streets, members of which have had long foundry experience and are among the foremost experts on castings on the coast. The cylinders, pistons, piston rings, combustion chambers, etc., are made from a special iron, according to the formula found best at the Swedish plant, insuring the uniform standard of material. The crank-shafts also are made from special steel, the forgings being done by the American Forge company, which has one of the largest shops on the coast for this class of work, and they are subjected to especially rigid inspection. The first shaft, as shown in the photo, is being turned by the Union Machine company, which has handled a great deal of heavy marine engine work.

Mr. Johansson is now at Astoria, supervising the first installation at the McEachern yard. This vessel, similar to those for which engines are now being built, is a 250 ft. auxiliary four-masted schooner. It is 43 ft. in the beam, with a molded depth of 21 ft. and will carry 2,200 tons, or over 1,600,000 ft. of lumber. The vessels are of the usual Pacific Coast lumber schooner type, except that they are framed somewhat stronger than most vessels built in the past, and embody various improvements.

The Skandia installations thus far made on the coast have all been of large power, owing to the fact that such engines were in most urgent demand, but the fact that this engine was originally designed to meet the needs of fishermen and other small-boat operators, for whom it is especially well adapted, is not being forgotten. The smaller engines have obtained a great vogue with the Scandinavian fishermen, who have severe conditions of sea and weather to contend with, and whose principal requirements are unfailing reliability in all possible conditions, simplicity and ease of control, ability to run for long periods with little attention, and to idle or run at low speed much of the time. The same features are also required of an engine to be used by the San Francisco fishermen; while the great economy possible with a small engine burning crude oil is a high recommendation of the Skandia to local fishermen. The latter accordingly are taking a keen interest in installations of 10 h. p. Skandia engines in two fishing boats of the usual San Francisco type, which are being built by B. Caviglia at Fishermen's Wharf, boats about 30 ft. in length by between 8 and 9 ft. beam. Their performance when completed will be closely watched by the fishermen, and there is apparently a promising field here for the Skandia engines in small sizes, down to 5 h. p. J. H. Hansen & Co. are also getting in a line of stationary engines, suitable for running electric light plants and auxiliary machinery on ships.



UPPER SECTION: PATTERNS FOR CONNECTING ROD BEARING SHELLS 240 H. P. MODEL SKANDIA
MIDDLE SECTION: PATTERN FOR CONNECTING ROD. ABOUT 4 FEET OVER ALL
LOWER SECTION: PATTERNS FOR AIR INTAKE BOX AND COVER

JAPAN STUDIES THE OIL ENGINE.

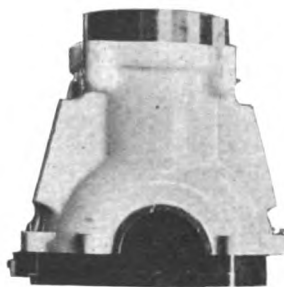
A recent visitor to the Pacific Coast is Baron C. Shiba, doctor of engineering and professor of mechanical engineering at the Imperial University at Tokyo, Japan. Baron Shiba comes in behalf of this government institution to make a thorough study of the development of the Diesel engine as represented by the present progress on the Pacific Coast.

THE WEATHER VANE.

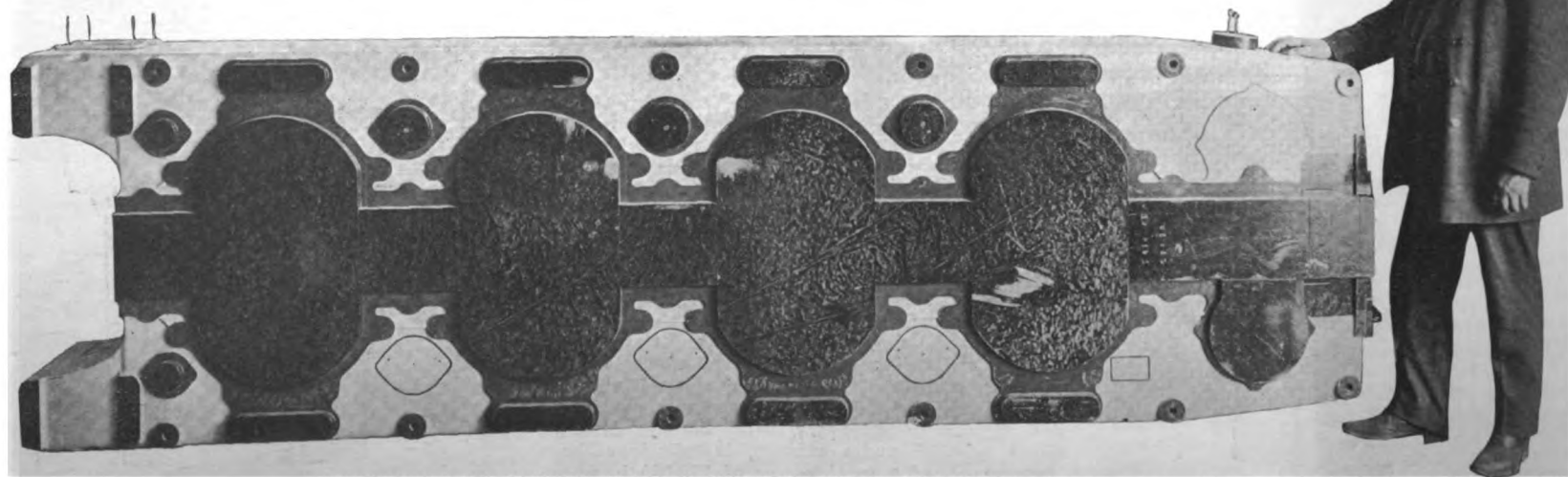
There was a time when the New London Ship and Engine company, exclusively built two-cycle-type marine Diesel-engines. In their September announcements they boldly state that to-day in America the only heavy-duty Diesel-engines in successful and continuous operation are the four-cycle engines built and installed by themselves.

CONCRETE SHIP ON FIRST TRIP.

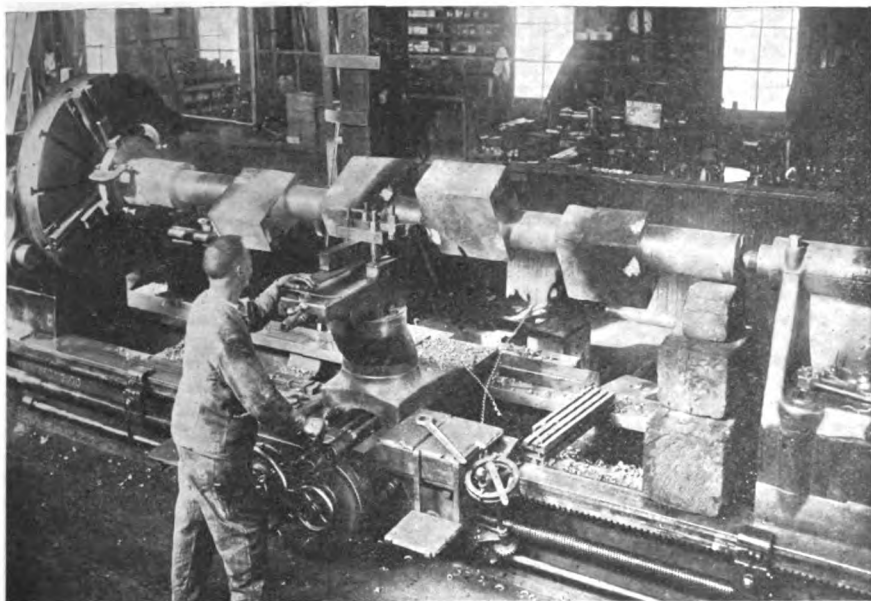
A new type of ship has arrived at Christiania, Norway, from the shipyards of Christianafjord. The ship, which resembles a huge barge, is constructed entirely of concrete, except for the ribs, which are of steel and is the first stone vessel ever used commercially.



CRANK HOUSING WHICH GOES BETWEEN CYLINDER AND BED PLATE SKANDIA ENGINE



PATTERN FOR BED PLATE OF 240 H. P. 4-CYLINDER MODEL SKANDIA: LENGTH 13.6 O. A. WIDTH 3.6



TURNING CRANK SHAFT FOR 240 H. P. 4-CYLINDER MODEL SKANDIA

This crank shaft is 13 feet long and has a 6 $\frac{3}{4}$ -inch dia. bearing. It is made of open hearth carbon steel to Lloyd's requirements

NEW SHIPYARD FOR TACOMA.

Articles of incorporation have been filed at Olympia for a new shipbuilding plant to be located near the city waterway, at Tacoma. The new yard is to be known as the Northwestern Shipbuilding Corporation and is to be built at once, and the keels of two motorships are to be laid as soon as possible.

John Martinolich, of Dockton, well-known ship designer and builder, and Colonel C. A. Pabst, formerly of Tacoma, are prominently associated with the new concern. Although the new company is the third to begin motor schooner construction in Tacoma, its promoters were the earliest to make preparations, having obtained a lease six months ago on one of the most valuable sites for his purpose on Puget Sound.

The shipyard will occupy the north end of the Northern Pacific Railroad fill, adjoining the new Seaborn Shipyards. Ways are to be built to allow launching directly off the end of the fill into the bay instead of into the City Waterway. Space leased is sufficiently wide at the end of the fill to allow of the laying of six to eight parallel keels. Ample room lies just at the rear of this waterfront for the location of shops and yards, which are to be conveniently served by the railroad from the land side.

The two vessels being designed at present are to be wooden motorships with schooner rig. They are to be 250 feet and 266 feet in length respectively, of heavy construction, and large cargo capacity. Mr. Martinolich states that in the plans outlined by the new company, these two motorships are but the beginning, and that it is the new company's intention to build a permanent plant or the construction of steel vessels.

The Dockton yard, which Mr. Martinolich has operated successfully for several years, will be reserved for small boat building. This yard has turned out a number of well-known passenger boats and yachts, among them being the "Nisqually," now on the run between Tacoma and Olympia, and the "Vashon," operating between Tacoma and Vashon Island points.

Col. Pabst is one of Puget Sound's well-known marine men, and a former Tacoma business man, having been at one time officially connected with the Puget Sound Iron & Steel Works, and later with the Seattle Dry Dock & Construction company at Seattle.

BOLINDER-POWERED BOATS ON FIRST VOYAGE.

San Francisco, Sept. 20, 1916.

The Starlight and the Moonlight, first completed of six similar vessels for the Standard Oil company of New York, equipped with 320 b. h. p. Bolinder fuel oil engines of the latest design, Type M2, have just completed their first voyage between Montreal and New York, giving a notably satisfactory account of themselves.

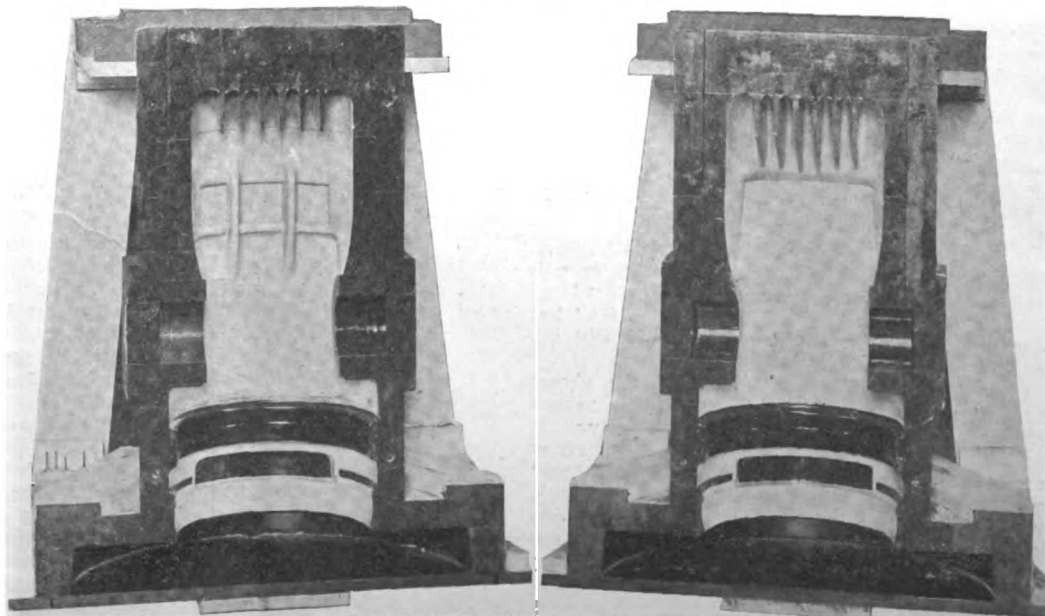
The vessels are four-masted auxiliary schooners, having a dead weight capacity of 3,200 tons. The initial voyage was made under generally adverse conditions, with head winds much of the time, and heavy seas throughout the trip; but in spite of this the average speed for the trip was

better than 7 knots, and the engines behaved splendidly at all times, regardless of conditions.

The Vacuum Oil company, a subsidiary of the



PATTERN FOR PISTON OF 240 H. P. 4-CYLINDER SKANDIA



PATTERN FOR CORE BOXES FOR PISTON OF 240 H. P. SKANDIA

Standard, is having four 4,500-ton auxiliary vessels built at Baltimore, each vessel to be equipped with three 600 b. h. p. Bolinder engines. The ships are expected to make an average sea speed of 11 knots.

DIESEL MAN COVERS NORTHWEST

Burt D. Powleson, in charge of the San Francisco offices of McIntosh & Seymour, has returned to that city after a tour of the Northwest. Mr. Powleson reports that his company can now make nine month deliveries on its marine Diesel engines which are of the 4 cylinder "Polar" type, built under license from the Aktiebolaget Diesels of Stockholm, Sweden.

LARGE ORDER FOR SEMI-DIESELS

The Skandia Engineering Company's branch at Seattle has received an order from the Heath Shipbuilding company of Portland, Ore., for twelve 240 b. h. p. semi-Diesel engines costing \$200,000 which will be installed in the Norwegian schooners contracted for by the above shipyard.

SKANDIA MAN COMES HERE FROM SWEDEN.

A. Johansen, of the Aktiebolaget Atlas of Lysekil, Sweden, patentees and manufacturers of the Skandia surface ignition heavy oil engine, has arrived on the Pacific Coast from the factory and will supervise the mechanical details incidental to the manufacture of Skandia engines in the United States by J. H. Hansen & Co., San Francisco.

LAUNCH OF DIESEL-DRIVEN PASSENGER BOAT.

The "Aloha," the latest addition to the H. B. Kennedy fleet operating on Puget Sound, Wash., was launched at the Wilson shipyard, Seattle, September 15. This company owns the fastest line of steam ferry boats on the Pacific Coast and it therefore is notable that the latest addition to their fleet is a Diesel-powered vessel. "Aloha" is 185 ft. in length, 22 ft. beam on a light draft of 4 feet. The motive power consists of a 75 b. h. p. 3 cylinder type compound Diesel manufactured by Fairbanks-Morse and is the first to be equipped with the electric quick-starting device which enables the engine to be operated within 60 seconds from stone cold. The trials are expected to be held early in October.

HENRY LUND VISITS NORTHWEST.

Henry Lund, of San Francisco, accompanied by Mrs. Lund, paid an extended visit to Seattle during the past month. Mr. Lund is the general representative for the Pacific Coast for the Bolinder engine.

TECHNICAL ARTICLES WANTED.

Motorship will be glad to receive and pay for accepted manuscripts dealing with any of the technical questions relative to design, construction or operation of marine motors or commercial motor vessels of all sizes and types. We particularly invite correspondence from foreign countries. Good photographs will also be very acceptable to us.

MOTORSHIP

A Journal devoted exclusively to Commercial Motor Vessels and their operation. Issued on the 25th of each month.

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TO AMERICAN SHIPOWNERS.

Unfortunately the majority of shipowners in this country do not seriously regard the present position, or the future of, the mercantile motorship; but seem to believe that what has been done is merely a flash-in-the-pan and that it is but a matter of a few years before the present movement filters out—at least, this is the impression gained by the writer as the result of talks with a number of New York shipowners.

It is hard to believe that, in the face of the commercial success of the greater majority of motorships in service and in the face of the encouraging attitude of their owners, that good business men, (such as most American shipowners are) could be so blind as to the assured future of the motor-freighter, with particular reference to cargo-vessel and tankers up to about 10,000 tons D. W. C.

But, to one who has followed the development from its earliest days, it is quite easy to understand how they accrued the reasonings that led them to misconstrue the entire situation.

Lack of proper personal investigation into the motorship's development as a whole has had much to do with the mis-conception that has formed in their minds. Instead of making really exhaustive inquiries, they have contented themselves with visiting one, two or maybe three ships (vessels that were ordered in the earliest stage of the marine Diesel engine development, and that were built under circumstances and conditions that virtually assured failure before they were launched) that happened to have visited American waters, and such were regarded as typical examples of motorships, absolutely regardless of the circumstances attending their construction. That is to say motorships were treated lightly because of a few individual cases of non-success.

Now, in Europe there are two very large firms, each of whom have about a dozen large Diesel motorships in regular operation, which maintain schedules even more regularly than steamers.

We think we are perfectly correct in saying that not half-a-dozen American steam shipowners have bothered to communicate with these motorship owners and obtain an authentic report on the actual performances of these profitable freight-carrying craft. Records at Lloyds prove that the majority of large Diesel ships are now as reliable as steamers. It is quite feasible for American shipowners to assure themselves of the fact.

Furthermore, nearly every week or so one, or two, and even three large Diesel-driven cargo-vessels enter New York and Philadelphia harbors, but rarely does a shipowner go aboard. True it is that these vessels are usually entered as S.S. "So & So," instead of M.S. "So. & So," but checking the lists with Lloyd's register will immediately reveal which are motorships.

Again, the "N. Y. Maritime Register" shows the movements of all the big mercantile motorships all over the world. Every shipowner in his own interests should set a clerk, or office boy, to watch the movements of motorships, and enter-up their times taken on voyages, although, by the way, we this morning noticed that one motorship now enroute for New York from London is reported as being at Harve enroute from New York City. This entry has been the same for three weeks.

As many of these vessels are incorrectly en-

tered we gladly will furnish any shipowner, upon application, with a list of about 30 of these vessels and their tonnage, etc., and they can easily follow their operations, although they may be entered as steamships.

Seeing that a motorship of about 5,000 tons D. W. C. under normal conditions means a gain of fifty thousand to one hundred thousand dollars per annum, it will pay every shipowner to engage a man specially to make reports to him. Why! Even one little ship of 1,200 tons D. W. C., purchased by the Anglo-Saxon Petroleum Co. six years ago, has meant to them a saving of eleven thousand dollars per annum under normal conditions when compared with similar sized steamers. Today this little motorship must be a gold mine to them. No wonder they now have ten other, and larger, Diesel-driven craft.

In Europe a firm of considerable importance is the East Asiatic Company, who from the outset have been most successful as steamship owners. This firm already has a dozen Diesel ships of 7,000 to 10,000 tons D. W. C. in service, and have ordered nearly twenty additional big Diesel ships, some of which are to replace ten steamers recently sold by them. They make no secret of the fact that they are convinced of the immediate success of motorships, and that steamers cannot be run in competition.

Is this not enough proof for shipowners in our country?

More evidence of the future of the motorship as a freight carrier is that three of America's largest shipbuilders, namely, Cramps, Newport News, and New York companies, recently purchased at great expense, the rights to build Diesel engines of such ships.

Another point is that when many of our shipowners have decided to seriously consider the construction of a motorship, they have turned to their builders for advice. Naturally the builder in most cases poo-poo's the thoughts of a motorship and strongly advises the prospective owner to have steam. Why? Because to build a motorship means considerable study and time for him; an upset of his machine shop; the scrapping of his steam-engine patterns and drawings; and the closing-up of his boiler-shop. Thus he sees but little profit in his first motorship.

Under these circumstances it is not difficult to see why most shipbuilders are adverse to motorships. The shipbuilder little seems to realize that an order for two twin-screw motorships of similar power means very profitable engine construction. For it results in the manufacture of 48 cylinders, 4 or 8 camshafts, 48 valves of one size, 72 valves of three other sizes, 4 crankshafts, 4 bed-plates and other parts in equally quantity-production numbers. When the shipbuilder realizes this, he will advise the shipowner that motorships really are successful. Maybe things will then move some.

Finally, we will point out why the future of the motorship is assured. When normal conditions return, or if a slump comes, there positively is bound to be a freight-rate-cutting war. How is it possible for a shipowner with, say, six steamships of 8,000 tons displacement and carrying 4,500 tons of cargo, to compete with a rival shipowner who has six Diesel ships of 8,000 tons displacement, but each carrying 5,500 tons of cargo, even if we leave the more economical fuel costs of the motorship out of the question? Can the shipowner, who does not believe in the motorship, answer this to his own satisfaction?

STANDARDIZATION OF THE CONSTRUCTION OF SHIPS.

Considerable publicity has been given to this subject and being of national interest it is well worth studying.

To quote an English contemporary which speaks authoritatively: "We have seen what the Americans can do in reducing manufacturing costs by standardization, labor-saving machinery, and production on a colossal scale; motor cars, cash registers and other appliances being sold in large numbers over here (England) at prices we are at present unable to compete with. If similar principles can be successfully applied to the building of ships on the other side of the Atlantic (U. S. A.) we may yet have to look to our laurels."

To manufacture and ship steel vessels the same as we do motorboats knockdown for the shipyard to assemble, plate and launch is only a matter of organization, together with the co-operation of builders and buyers, and Pittsburg might easily become a shipbuilding center with its steel mills turning out several hundred knock-down steel vessels of various standard sizes per

annum. These shipped to coastwise shipyards for erection, would cost less per ton construction than what the builder has to pay today, as there is no waste after he receives his steel shaped, punched and ready to assemble. His output would be trebled and cost of production lowered enabling him to compete successfully in foreign markets.

In addition to which most of the expensive machinery necessary today in a shipyard need not be included, lessening the necessary working capital.

Prior to the war a visit to the large shipping ports of the world revealed a motley fleet of steamers; today it is worse, as anything which can float and be classed as a bottom is placed in commission.

The ordinary layman can see little or no difference in the character of steamers of similar dimensions, and the days of retaining certain individual characteristics in type and rig of ocean-going vessels have long since passed. Therefore why not a standardization, or a one-design class in various sizes which will perform the all-round service for which freight carriers are used, such vessels to be built to standard specifications and requirements acceptable to all governments and underwriters throughout the world, starting with 1,000 tons dead weight and increasing by 1,000 tons up to 10,000, or 12,000. The latest form of construction which includes double bottoms is equally as well-suited for a Diesel-driven vessel as for steam as the tanks thus provided would be used in both cases for fuel oil, not only giving a lower center of gravity but utilizing a space hitherto of no value except for water ballast.

SUGGESTS GOVERNMENT AID DIESEL BUILDERS.

Editor, Motorship:

What the outcome will be, following the cessation of hostilities in Europe, is problematical but the world will sooner or later witness the greatest rate cutting war shipping has ever experienced when Diesel-driven vessels will operate at a profit and steamers at a dead loss. This is not a prophecy but the logical outcome of basic facts.

Where are the Diesel engines coming from with which to equip these vessels?

Europe is ahead of us in the development of and production of Diesel engines and will want everything she can produce for her own vessels. Today the demand far exceeds the supply of our own production and on the Pacific Coast they are installing steam in some of the new vessels because certain makes of Diesels are not to be had for love nor money for months to come. A round score of machine shops are tackling the manufacture of such engines but in strict secrecy. Why cannot the government father this important development and thus save the manufacturers months of experimental work and thousands of dollars in expense? It would get its reward twice over in the immediate revenue from such ships in operation and a further revenue from manufacturing rights. No sane manufacturer will choose between his draftsman turning out a lemon and an order for a set of engines of proven reliability and bearing the government stamp. When your readers have read the article in this issue which exposes the European Diesel fiasco they possibly will agree that Uncle Sam should take a sporting chance and develop a standard type of Diesel, two or four-cycle or both, and farm out the manufacturing right to those who will be only too glad to pay for this privilege. This would not prevent anyone from following along the lines of his own pet theory and obtaining patents if he so chooses. Nor would it harm existing manufacturers who are overloaded with orders but the nation wants Diesels, more Diesels, and then some.

O. S. H.

SOME DEVELOPMENT!

Discussing the question of development, a well-known engineer said that a little over four years ago he was in the engine-room of "Selandia," a second ocean-going Diesel-type motorship, a craft of 2,500 h. p.,—on her maiden voyage. Fifteen years previously to that he was sitting on the uncomfortable seat of a motorboat driven by an engine that developed no less than 1½ h. p., and endeavored to purchase a 4 h. p. engine. But in vain, for the inventor considered that to install such a high-powered engine would be a leap into the dark that he was not justified in taking.

Where Are Our Oil Engineers to Come From?

To the owner or owners of vessels driven, and to be driven, by Diesel or semi-Diesel engines this problem is of the most vital importance, especially on the western seaboard, where little or no practical knowledge of operation can be obtained at this date, and yet within a few months we will have a large fleet of motor-driven ocean-going vessels requiring skilled engineers. One would naturally think that the owners of vessels now in course of construction and the representatives of engine manufacturers would make some combined move for their own common security in this matter, but to date no such action has been taken. An oil engine running into thousands of dollars, and the best in the world, can be ruined quicker through incompetent handling than perhaps any other known piece of mechanism, yet everyone is apparently awaiting the miraculous appearance of trained Diesel engineers with perfect confidence.

One firm of owners propose selecting and sending a bright man with gas engine experience to the factory where their engines are being built for the purpose of obtaining knowledge of construction and operation in this manner, which is practical, but a man desirous of acquiring a thorough course in Diesel engineering for the purpose of preparing himself for such position is totally at a loss to obtain same, at the same time knowing that hundreds of such positions as marine Diesel engineers must be filled within the next year or two. The good gas engine operator is not going to satisfy the underwriter even if the owner is indifferent as to his marine Diesel experience and it does not follow that a good gas engine operator will make a good Diesel engineer, as a matter of fact many Diesel representatives contend that the steam engineer is the better man of the two because he has had a higher training and the principle of operation being equally foreign to both, the better educated man, accustomed to large units, will grasp it quicker and more thoroughly.

We have at this moment the nucleus of such a body of men in the machine shops and the erecting shops of our shipyards, men with second and chief engineers' tickets who would gladly take up the study whilst engaged in their present employment if it were possible to do this and at the same time support themselves and their respective families. For this man a night class is the only solution, with the assistance of good text books. Then we have the student who wishes to follow it both in theory and practice. We as yet do not know all of the State Universities which have included Diesel Engineering in their curriculum, but there are a few, and the Washington University is not among them, but through no fault whatever on the part of this particular institution. The demand for such a study has only just arisen and we have the assurance of President Suzzallo that it will receive immediate attention. We know as a matter of fact that such a course would not only now be open to students, but also a special class provided for those not following the regular university course and who wished to only take the theory of Diesel engineering. These would have been in operation had Dr. Suzzallo had the support and encouragement from the gas engine men and others interested.

The present appropriation would, of course, be insufficient for demonstrating operation. A Diesel engine costs thousands, but the technical part can be taken care of and when our manufacturers reach the stage of completion the student can acquire the operative knowledge through the courtesy of these people.

The State of Washington and its seaports are therefore fortunate in having the offer of co-operation from its university and the men chosen by Dr. Suzzallo have a state duty to perform in lending every effort to assist him in perfecting some plan whereby our shipping industry will benefit through their efforts to provide a technical and practical training for our Diesel engineers.

From the Underwriters' Point of View.

Capt. S. B. Gibbs, Seattle representative of the San Francisco Board of Underwriters, in an interview with a Motorship representative, expressed himself as follows:

"The insurance of Diesel driven vessels is today occupying the minds of all underwriters of marine insurance and extra care is exercised by us before accepting such a vessel as a risk. Werkspoor, Bolinders, and other makes of engines have inspired confidence but there are un-

fortunately some which have proved a dead loss to the underwriter. Only a small proportion of the insurance is therefore accepted by any one company and a vessel valued at a million dollars with a cargo of two million will practically exhaust the present market as many foreign countries are now precluded owing to the war.

"Gas boats have been our bugbear but we are willing to forget this when the larger engine proves reliable. Many unforeseen happenings occur with steamers at sea but the conditions governing Diesel auxiliaries and motorships are totally different and to expose these for the purpose of improvement will be a step in the right direction. We acknowledge the excellence and reliability of several makes of Diesel engines but the best of them in the hands of inexperienced and unlicensed operators are apt to give trouble. Underwriters throughout the world therefore cannot know when a change of engine room staff may increase the risk and until Board of Trade certificates are obtainable and compulsory this undesirable feature will remain. Captains of sailing ships converted to auxiliaries will make port without a tug or pilot and the same will happen in clearing from a port. Further, instead of standing off-shore with barometer indicators threatening bad weather, he may rely upon his engines to make a dash along a lee shore for purpose of making port speedily. All these points are of vital importance to us."

Ernest S. Livingston, assistant general agent Aetna Insurance company of 301 California St., San Francisco, was present at the interview with Capt. Gibbs and heartily approved his statements. In answer to our request for information as to what the underwriters of San Francisco were doing to improve conditions, they replied that the matter had never been taken up seriously as they, the underwriters, were waiting for such a move to come from the Diesel engine manufacturers, their agents and owners of vessels equipped, and to be equipped, with Diesels, but it would certainly receive their attention immediately Mr. Livingston returned to San Francisco.

The conditions upon which they will insure such vessels points conclusively to their cautiousness and lack of confidence, and for motorship owners to sit down and accept such terms without trying to improve matters is somewhat pathetic.

Diesel insurance is written with a deductible average clause in which the owner agrees to stand the first 10 per cent of the loss of amount insured. This applies also in cases of steamships where the owners wish to obtain a special low rate of insurance but it will apply generally upon motorships and auxiliaries at a higher rate of insurance, say 7½ to 8 per cent. In illustration, a vessel insured for \$100,000, if damaged to the extent of \$11,000, the owner recovers \$1,000 only.

The Engine Builders' Point of View.

The question of the provision of engineers for Diesel and "semi-Diesel" driven ships seems more difficult than it really is. It is a matter that is brought to the manufacturers' attention frequently by prospective motorship owners; but is one that is easily answered. With such ships that are in service the owners sent the engineer (whom they intended to place in charge of the motor vessel) to the builder's works during the final months of the construction of the machinery, where he soon became proficient in the handling of large oil engines. Learning is aided in cases where the Diesel engines are designed along steamship lines, and by the time the ship is ready for her trials he is capable of teaching his assistant engineers.

Furthermore, it is usual for the builders to send two or three "guaranty-engineers" from the works with the ship for her first three months operation, and these men can attend to anything that the ship's engineers may not detect until they become proficient.

The Anglo-Saxon Petroleum company of London, are owners of ten large ocean-going Diesel-engined ships, and when giving an address before the Institute of Marine Engineers, on February 24, 1913, Mr. C. Zulver, the Marine Superintendent, was asked if a special class of men were required to run Diesel engines aboard ship.

Mr. Zulver, who certainly should know, replied as follows: "Our experience in that respect is

that any marine engineer of ordinary intelligence and experience can soon become capable of running and handling a Diesel engine installation, and it is certain that no special, or highly skilled men are necessary to look after a Diesel plant." Now this was in 1913, and conditions are better today, and the engines are more reliable and more simple.

Mr. Basil H. Joy, shortly afterwards remarked, at the same meeting: "With regards to the class of man to be employed on Diesel-engined vessels, I was on the original trip of the m. s. "Vulcanus" (the first large ocean-going Diesel ship) and for a large part of the run I was the only man in the engine room. It seemed that they did not require a man to look after these engines." Mr. B. H. Joy is a technical editor of the London "Engineer."

So far as the writer can discover no large Diesel-engined ship ever has been held up in port for lack of engineers to run the machinery, and, if the owners of ten motor vessels have no difficulty, why should an American owner expect difficulty with one or two Diesel-driven ships?

In a number of instances, the engine-room staff are paid higher wages than with steamships, but not in all cases, as during September the writer went aboard a big British motorship and found that the assistant engineers were receiving but \$5.00 a month more than firemen. The actual wage was \$50.00 and \$55.00 per month, whereas in their previous steamship they were getting \$60.00 and \$65.00 per month. They were content to accept the smaller wage in order to get aboard a motorship and learn. The experience was worth the loss in wages. However, the economies effected are so enormous that the motorship owner can afford to pay double and treble wages in order to attract good engineers. T. O. L.

ENLARGING STANDARD GAS ENGINE PLANT.

The Standard Gas Engine company is proceeding rapidly with its preparations for the manufacture of the Southwark-Harris Diesel engines in its Oakland factory, and is now at work on the necessary expansion of the plant, to which is being added the machinery recently purchased from the Corliss Gas Engine company. The contract for the removal of this equipment from Petaluma to Oakland has been awarded to Chas. Ehlert, manager of the Oakland Launch & Towboat company, who towed over the first barge load of machinery September 20, and will soon have the job completed.

The Standard company now has the foundations laid for the extension to its building, which is to be used for shipping and the storage of stock. The former stock and shipping rooms of the old plant will accommodate the addition to the manufacturing department. While the new addition is being erected, however, the Corliss machinery will be given a thorough overhauling, some of the tools being entirely rebuilt.

The acquisition of these tools, indeed, is a matter of the greatest importance to the Standard company. It has greater significance than the mere addition of so many tools to the plant, and in fact marks the final departure from the system of shop organization which has sufficed for the moderate needs of the past and the adoption of the methods of large scale manufacturing as worked out by some of the largest concerns in the country.

The addition of the Southwark-Harris line to the output, as well as of the Corliss models, and the general increase in demand for its products, now warrant the company in putting in many single-purpose tools, to be used for one operation exclusively, and so designed as to handle that particular work with the greatest economy; and the purchase of the Corliss machinery will enable the company to convert a number of these tools to handle such special work, instead of using them as before for general operations. These changes are being made according to plans worked out by Richard Froboese, formerly chief engineer of the Corliss Company, who made a special study while on his Eastern trip of the economies effected by the use of special tools, and scientific division of manufacturing operations. It is estimated that the new method will not only bring about important economies in operation, but will also enable the plant to handle the work much more rapidly.

Pacific American Fisheries Shipbuilding Plant



E. B. DEMING
The Progressive President of the Pacific American Fisheries

The Pacific American Fisheries, of South Bellingham, Wash., under the able and progressive management of its president, E. B. Deming, has the reputation for being one of the most progressive companies operating on the Pacific Coast. It was the first canning company to put a semi-Diesel engine in a cannery tender, the first to use a vacuum machine in place of steam box in putting up a pack of Canned Salmon, the first to can codfish on the Pacific Coast, and now they are the first to establish a shipyard on a large scale for the purpose of building vessels for their own use.

When the company purchased the old Hackett cold storage plant and adjoining ground at Commercial point, in South Bellingham, Wash., not long ago, and announced that it was to be turned into a shipyard, most people thought that it would be fitted merely for building small cannery tenders and fishing boats, but when a representative of Motorship visited the plant recently he found two large vessels on the stocks and a large force of men rushing work on them in order to have them ready for the early part of next year.

The old Hackett plant has been turned into a workshop and office, while a large power plant has been established just to the westward of it. Roads have been cut through the hill encircling the land side of the property, and ultimately it is the intention of the management to remove the mounds of dirt remaining, thus largely increasing the space available for work. An ample depth of water is to be found at this point for vessels with almost any draft, while more dock space for the equipping and outfitting of

the newly-built craft is to be had at the immense cannery docks of the company alongside the shipbuilding plant than will be needed for some time to come.

Bellingham is especially well suited in other respects for the establishment of such a plant. Shipbuilding material is abundant and cheap here, skilled and unskilled labor is to be had when needed, while its location about midway of Puget Sound is ideal.

The company's rapidly expanding fishery interests in Alaska, and especially in western Alaska, has made necessary the use of a fleet of large vessels for the purpose of carrying north the fishing crews and outfits for the canneries, and bringing back later the crews and finished product of the plants. Not finding in the general market just the class of vessels they needed, the company decided to establish a plant and build them.

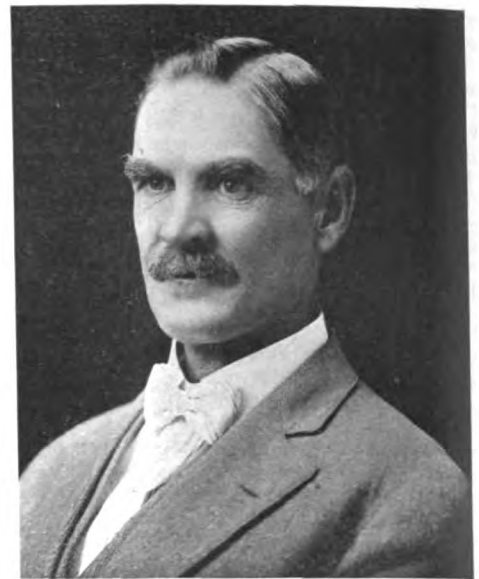
The two vessels now on the stocks are each 235 feet long overall, 42 feet beam outside of planking and 25 feet 9 inches moulded depth; they will have two full decks, the height between the decks being 8 feet 9 inches; part of this 'tween deck space is to be occupied by oil tanks of 1000 barrels capacity, the balance of the fuel oil (600 barrels) being carried in the lower hold just forward of the boilers. There will be two cargo hatches in these boats, with passenger accommodations, dining room, galley and refrigerator rooms between the hatches. A clear deck space of 70 feet is left forward of the midship house, for the loading of piling, lumber, etc., on deck, and the hatch at this end is 12½x22½ feet. Just abaft the after cargo hatch is located another passenger house and abaft this will be located the steam towing machine with which the steamers are to be equipped.

Above the dining rooms, galley and other rooms on the main deck amidship will be located rooms for first and second officers, manager, and other staterooms and social hall, and this will constitute the boat deck, which is supported on an extension of the midship frame timbers of the ship, thus making a very substantial support for the lifeboats.

Above the officers rooms will be the pilot house and just abaft this will be the captain's room, giving him quick access to the bridge.

The wireless operator's stateroom and office will also be located on this deck forward of the mainmast. Four special rooms with bath between have been arranged for the accommodation of owners when they desire to take a trip on these boats; these rooms will be furnished in white or ivory enamel and mahogany.

The plans of these vessels were made and the work in the shipyard carried on under the direction of Geo. H. Hitchings, who has had over 25 years' experience in Pacific Coast shipwork. One of Mr. Hitching's last jobs before leaving California was the laying down and moulding of the timbers of the famous steamer Humboldt, so



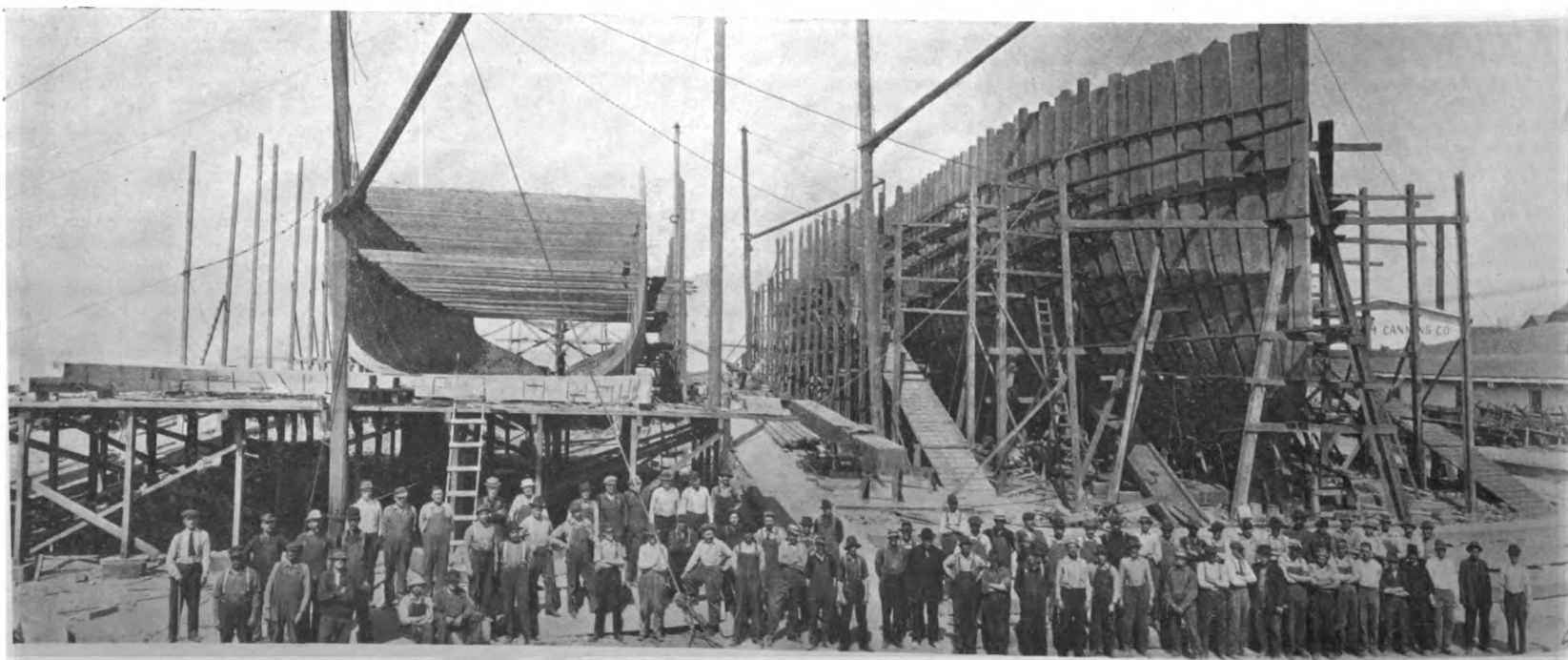
GEO. H. HITCHINGS
Designer of the Vessels Described, and Superintendent of the Shipbuilding Plant

well known along Seattle's front. His most recent work is the design of the new motorship Sierra for Eckwood Lumber Co., launched at Hoquiam on August 25, and the steamer Hartwood, soon to be launched from the same yard. Mr. Hitching was a contracting shipbuilder for 10 years and has some 35 sailing vessels and steamers to his credit.

It had been the company's intention to install Diesel engines in the vessels, but the difficulty encountered in securing early delivery of these, due to the demands of the warring nations having engrossed most of the output of the various plants for some months ahead, it was finally decided to install steam engines in them, and these are now under construction at the plant of the Seattle Machine Works, Seattle. The power plant will consist of twin triple expansion steam engines of 500 horsepower each, steam being supplied by two Scotch marine boilers 11 feet 6 inches by 11 feet 0 inches. All the hoists and auxiliaries are being built at the company's own machine shop under the direction of Fred Heath.

In order to make for uniformity the company has decided to name the two vessels Redwood and Firwood. They already have a steamer named the Norwood. Other ships which the company will construct as the need for them arises also will be given names from trees which grow in Washington forests.

It is probable that the Redwood will be the first one launched, possibly in November, while the Firwood will be launched about the first of the year. Both vessels will probably go into commission early in the spring.



SHIPBUILDING PLANT PACIFIC AMERICAN FISHERIES, BELLINGHAM, WASH.

EIGHT MOTORSHIPS BUILDING IN B. C.

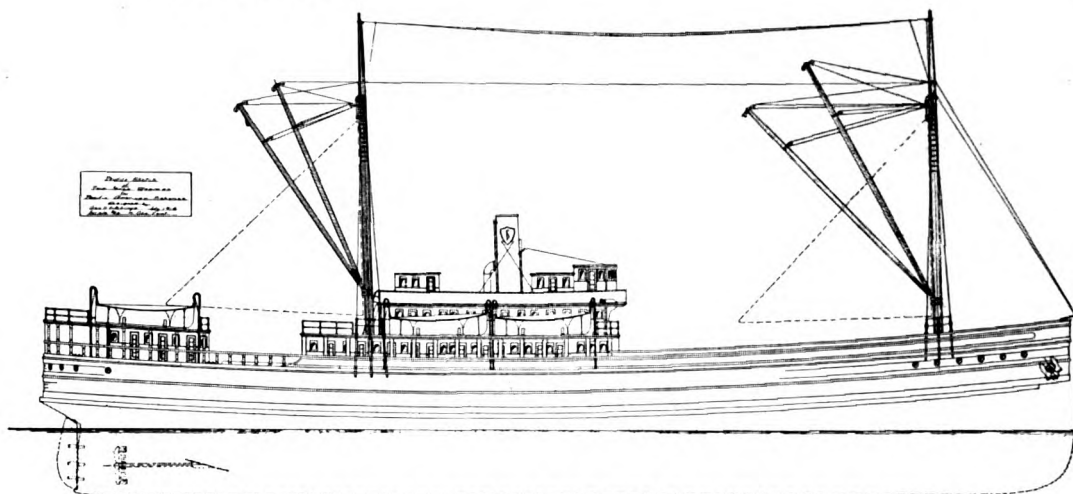
Vancouver, B. C., Sept. 23, 1916.

In British Columbia the motorship industry is well under way. Three ships will be completed by the end of the year and three more will be long past the framing stage.

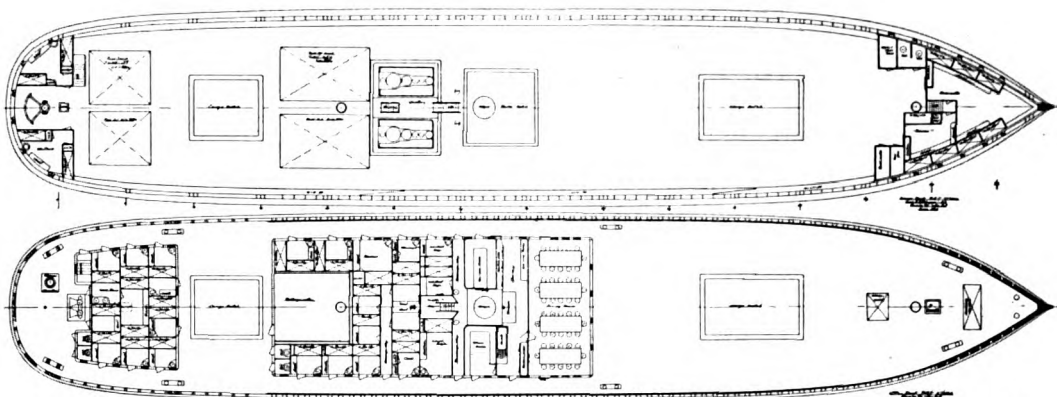
The H. W. Brown Co., Ltd., is the center of this industry. H. W. Brown is general manager of the H. W. Brown Co., Ltd., and also of the Canada West Coast Navigation company. The former company has charge of the actual construction, while the latter will own and operate the ships. Two shipbuilding companies are engaged in the construction of these ships which have been undertaken under the provisions of the Shipping Act of the British Columbia government. They are the Wallace Shipyards of North Vancouver and the Cameron & Genoa Mills company of Victoria.

The H. W. Brown Co., Ltd., is a brokerage company for the Canada West Coast Navigation company, which is a new shipping concern organized under a federal charter with a capital of \$2,500,000 to engage in shipping and transportation. Prominent among those interested are James Caruthers, president of the Canada Steamship Lines, Ltd., a \$30,000,000 concern, and one of the biggest grain operators in Canada; J. W. Norcross of Montreal, vice-president of the Canada S.S. Lines; James Whalen, president of the Western Drydock & Shipbuilding company of Port Arthur, Ont.; M. J. Haney, railroad contractor of Toronto; Sir Trevor Dawson, manager of the Vickers Yards of England; R. M. Wolvina, Great Lakes transportation man, and well known in Canada as a grain dealer; H. W. Brown, formerly of the Pittsburg S.S. company of Duluth. There is both money and brains behind the motorship business in British Columbia.

Altogether there are today eight motorships under construction in British Columbia, two in Victoria and the remainder in North Vancouver. The capital investment in these ships when completed will be \$1,500,000. They are wooden motorships, rigged as five masted schooners, and may be classed with the general type of motorship that the Swedes and Danes have made notable. Their designs are new in shipping construction. Their lines are low, giving the maximum amount of space for cargo. J. H. Price, the designer, figures that the cargo space will be 95 per cent of the whole.



PROFILE PLAN OF VESSELS BEING BUILT BY PACIFIC AMERICAN FISHERIES



MAIN DECK AND ACCOMMODATION PLANS OF VESSELS BEING BUILT BY PACIFIC AMERICAN FISHERIES

In general, the dimensions of the ships are 225 ft. keel, 44 ft. breadth, 21 ft. depth, and 265 ft. over all. Their lumber carrying capacity is 1,500,000 ft., an amount that is in excess of the old-time windjammer.

Power is furnished by two Bolinder Diesel en-

gines, each of 160 b. h. p. and burning crude oil. These engines will drive the boats without the aid of sails at the rate of seven knots an hour when the vessels are loaded.

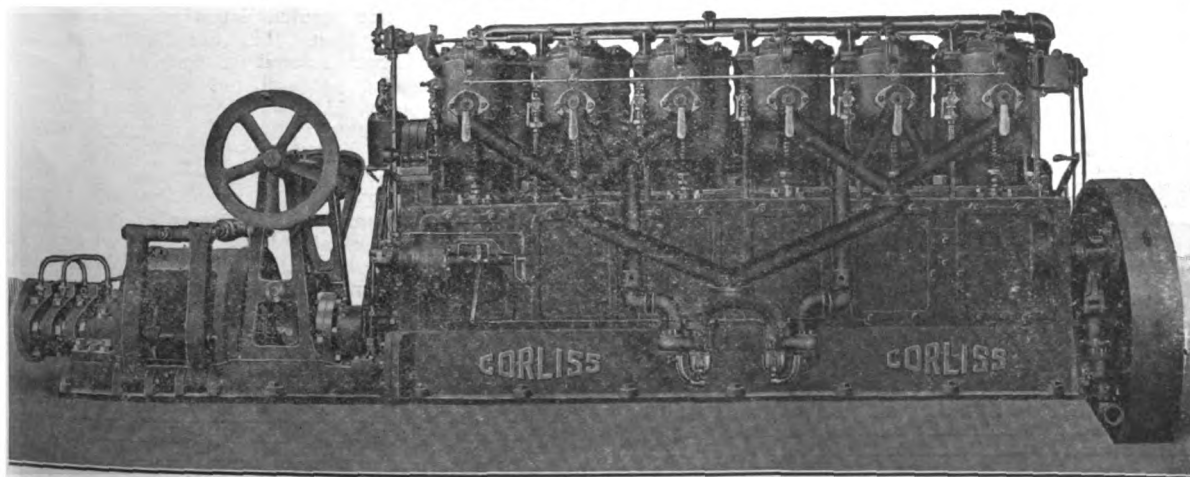
Designer Price has designed wooden ships for years on this coast. He designed the City of Portland.

CORLISS

*The Most Modern
Motor Made*

BUILT IN SIZES 7 TO 300 H. P.

1, 2, 3, 4 and 6 cylinders



IMPORTANT ANNOUNCEMENT

TO READERS OF MOTORSHIP

We take pleasure in announcing that we have purchased outright the plant of the Corliss Gas Engine Co., and will continue to build the well-known Corliss engine.

Corliss owners can therefore rely on parts being at all times available.

Practically the entire Engineering and Manufacturing Force of the Corliss Gas Engine Co. have entered our employ, and Corliss engines will now be built by these Corliss Experts, in our huge factory at Oakland, California, in a specially created "Corliss Engine Department."

It is our earnest desire to afford all Corliss owners prompt and efficient service, and every effort will be exerted to accomplish this end.

We solicit further orders for Corliss engines up to 300 Horse Power, and if advised of your requirements will gladly submit estimates.

STANDARD GAS ENGINE CO.

"Corliss Engine Department"

1 California Street
SAN FRANCISCO, CALIFORNIA

Corliss Distributors

Puget Sound, Wash.

BABARE BROS.

Seattle and Tacoma

Southern California

MARINE HARDWARE
CO.

San Pedro

(Other Distributors will be announced as appointments are confirmed.)

NEW U. S. SHIPPING ACT.

On September 7 Congress passed the act, commonly known as the Shipping Act, and under its terms a United States shipping board is provided to consist of five commissioners, who are to be appointed with due regard to their fitness for the position, and to represent a fair geographical division of the country, and not more than three to be from the same political party. The commissioners are to serve for two, three, four, five and six years respectively, and each to receive a salary of \$7,500 per annum.

For the purpose of carrying out the provisions of this act not more than \$50,000,000 are to be spent, and this sum is to be raised by the issue of Panama Canal bonds.

Sec. 5. That the board, with the approval of the President, is authorized to have constructed and equipped in American shipyards and navy yards or elsewhere, giving preference, other things being equal, to domestic yards, or to purchase, lease, or charter, vessels suitable, as far as the commercial requirements of the marine trade of the United States may permit, for use as naval auxiliaries or Army transports, or for other naval or military purposes, and to make necessary repairs on and alterations of such vessels: Provided, That neither the board nor any corporation formed under section eleven in which the United States is then a stockholder shall purchase, lease, or charter any vessel—

(a) Which is then engaged in the foreign or domestic commerce of the United States, unless it is about to be withdrawn from such commerce without any intention on the part of the owner to return it thereto within a reasonable time;

(b) Which is under the registry or flag of a foreign country which is then engaged in war;

(c) Which is not adapted, or can not by reasonable alterations and repairs be adapted, to the purposes specified in this section;

(d) Which, upon expert examination made under the direction of the board, a written report of such examination being filed as a public record, is not without alteration or repair found to be at least seventy-five per centum as efficient as at the time it was originally put in commission as a seaworthy vessel.

The President is authorized to transfer, either permanently or for limited periods, to the board such vessels belonging to the War and Navy departments and the Panama Railroad company as may not be needed by these departments and are suitable for commercial use. The board is also authorized to charter, lease, or sell to any person a citizen of the United States any vessel so purchased, constructed or transferred, or if such vessels become unfit for use to sell same, and under section 9 any vessels purchased from the board may be registered or enrolled and licensed, or both registered and enrolled and licensed, as a vessel of the United States and entitled to the benefits and privileges appertaining thereto, including the engaging in the coastwise trade of the United States. No such vessel, without the approval of the board, shall be transferred to a foreign registry, or flag, or sold; nor, except under regulations prescribed by the board, be chartered or leased.

When the United States is at war, or during any national emergency, no American vessel can, without the approval of the board, be sold, leased or chartered to any person not a citizen of the United States, or transferred to a foreign registry or flag. No American vessel, except one which the board is prohibited from purchasing, shall be sold to a non-citizen or transferred to a foreign registry or flag, without the board having been given the first chance to buy it. For infraction of section 9 a fine of not more than \$5,000, or imprisonment of not more than five years, is provided.

The President is authorized, without notice if an emergency exists, to take possession of any vessel purchased, leased or chartered from the board, for naval or military purposes and to pay the owner or lessee a fair value of same.

Sec. 11. That the board, if in its judgment such action is necessary to carry out the purposes of this Act, may form under the laws of the District of Columbia one or more corporations for the purchase, construction, equipment, lease, charter, maintenance, and operation of merchant vessels in the commerce of the United States. The total capital stock thereof shall not exceed \$50,000,000. The board may, for and on behalf of the United States subscribe to, purchase, and vote not less than a majority of the capital stock of any such corporation, and do all other things in regard thereto necessary to protect the interests of the United States and to carry out the purposes of this Act. The board, with the approval of the President, may sell any or all of the stock of the United States in such corporation, but at no time shall it be a minority stockholder therein: Provided, That no corporation in which the United States is a stockholder, formed under the authority of this section, shall engage in the operation of any vessel constructed, purchased, leased, chartered, or transferred under the authority of this Act unless the board shall be unable, after a bona fide effort, to contract with any person a citizen of the United States for the purchase, lease, or charter of such vessel under such terms and conditions as may be prescribed by the board.

The board shall give public notice of the fact that vessels are offered and the terms and conditions upon which a contract will be made, and shall invite competitive offerings. In the event the board shall, after full compliance with the terms of this proviso, determine that it is unable to enter into a contract with such private parties for the purchase, lease, or charter of such vessel, it shall make a full report to the President, who shall examine such report, and if he shall approve the same he shall make an order declaring that the conditions

have been found to exist which justify the operation of such vessel by a corporation formed under the provisions of this section.

At the expiration of five years from the conclusion of the present European war the operations of these vessels shall cease and the board shall dispose of all its property, purchasing the stock of other stockholders at a fair and reasonable value, and turn the proceeds into the treasury.

Section 14 prohibits common carriers from giving rebates to shippers, to use "fighting ships" to drive a competitor out of business, to retaliate against any shipper for patronizing another line, or to make any unfair or unjustly discriminatory contract with any shipper, and provides a penalty of a fine of not more than \$25,000 for each offense.

Section 15 provides that all agreements, both written and oral, between common carriers by water, or other persons subject to this act, shall be submitted to the board for its approval or disapproval, and provides a penalty of \$1,000 per day for each violation of this.

These agreements, etc., are exempt from the provisions of the "Act to protect trade and commerce against unlawful restraints and monopolies" (approved July 2, 1890), and the "Act to reduce taxation, to provide revenue for the government, and for other purposes," (approved August 27, 1894), and amendments.

The giving of undue preference or advantage to any particular person, locality or description of traffic, the transporting of property at less than the regular rates, or to influence any marine insurance company not to give a competitor a fair rate is forbidden, while the carrier is required to file with the board tariff sheets which shall be public, and the latter is authorized to change same should the one filed by the carrier be unjust, or unreasonable.

Any person may file with the board a sworn complaint setting forth any violation of the law and asking reparation for the injury and the board shall hear and determine such complaints, and in order to do this is authorized to compel the attendance of witnesses and the production of books, etc.

The board is also authorized to investigate the "action of any foreign government with respect to the privileges afforded and the burdens imposed upon vessels of the United States engaged in foreign trade whenever it shall appear that the laws, regulations, or practices of any foreign government operate in such a manner that vessels of the United States are not accorded equal privileges in foreign trade with vessels of such foreign countries or vessels of other foreign countries, either in trade to or from the ports of such foreign country or in respect of the passage or transportation through such foreign country of passengers or goods intended for shipment or transportation in such vessels of the United States, either to or from ports of such foreign country, or to or from ports of other foreign countries." The board is to report the result of its investigations to the President, who, if he cannot adjust them by diplomacy, shall transmit the report to Congress for action.

Section 36 was attached to the bill for the purpose of preventing foreign vessels from discriminating against American shippers and reads as follows:

Sec. 36. The Secretary of the Treasury is authorized to refuse a clearance to any vessel or other vehicle laden with merchandise destined for a foreign or domestic port whenever he shall have satisfactory reason to believe that the master, owner, or other officer of such vessel or other vehicle refuses or declines to accept or receive freight or cargo in good condition tendered for such port of destination or for some intermediate port of call, together with the proper freight or transportation charges therefor, by any citizen of the United States, unless the same is fully laden and has no space accommodations for the freight or cargo so tendered, due regard being had for the proper loading of such vessel or vehicle, unless such freight or cargo consists of merchandise for which such vessel is not adaptable.

THE FUTURE OF THE MOTORSHIP—A PROPHECY.

In ten years from now there will hardly be a freight, or tank, steamship afloat of under 10,000 tons d. w. c. All will be internal-combustion-engined and will use heavy-oil fuel. Such a prophecy is fully justified by a careful investigation of the shipping conditions of today, and the obvious super-advantages of the motorship when normal conditions return. It is impossible for an oil-fired or coal-burning ship to compete with a motorship on any long distance route. Unless the world's oil wells dry up, the fuel question will have but little bearing upon the question.—T. O. L.

THE 1916 CANNED SALMON PACKING SEASON.

1915 Canned Salmon Pack.

Western Alaska	1,316,171
Central Alaska	632,734
Southeast Alaska	2,540,436
British Columbia	1,133,381
Puget Sound	1,269,296
Columbia River	558,534
Sacramento River	6,179
Outside streams	182,951

Total .. 7,639,592

Approximately 1916 Alaska Canned Salmon Pack to Date.

Western Alaska (complete).....	1,475,000
Central Alaska (to Sept. 15).....	1,030,000
Southeast Alaska (to Sept. 15).....	2,137,000

Total .. 4,624,000

Sockeye Pack of British Columbia in 1916

Full cases.	
Fraser River	26,000
Other districts	164,000

Total .. 190,000

Sockeye Pack of Puget Sound in 1916.

Full cases.

Sockeyes, halves	65,000
Estimated Spring Pack on Columbia River in 1916	
Full cases.	

Chinooks principally 315,750

Review of the Packing Season.

Western Alaska.—Packing ceased in this section about August 1 and the vessels are nearly all at home once more with the season's pack. The season proved to be better than earlier reports indicated, and the pack is somewhat larger than that put up the previous season, a part of this increase being of the cheaper grades. Several new canneries began operations this year, which largely accounts for the increase.

Central Alaska.—Although under ordinary conditions packing would have ceased in this section before September 1, a few canneries continued to operate on fall fish until about the middle of September. An excellent run of Pinks occurred this season, and this, together with the fact that a number of new canneries began operations, caused a large increase in the total pack as compared with 1915. About the middle of August a large run of Reds appeared off Karluk, and the Alaska Packers Association cannery at Larsen bay, the only one in position to take advantage of it, managed to pack not only its original outfit, but also some thousands of cans brought from the association's other canneries to the westward.

Southeast Alaska.—In the northern portion of this region a good run of fish was had and most of the canneries packed their full outfits. A few, however, met with bad luck and failed to fill up, but these losses were more than made up by some few which brought in extra cans and filled them. Practically all of these canneries have now shut down for the year.

In the Wrangel and Ketchikan districts the run of Pinks was most disappointing, and none of the canneries had more than half a pack on September 15. Some of the larger canneries closed down, preferring not to increase their losses by operating during the fall season. Most of the smaller canneries are operating, however, but late reports are to the effect that neither Chums nor Medium Reds are abundant. Some fishermen claim that the Chums will not be abundant until about October 1, but the statistics of previous years do not bear them out in their statements. All of the plants operating are finding increasing difficulty in keeping their fishermen at work, the latter not liking to fish so late in the season, as the returns are not commensurate with the risks involved as a result of the usually stormy weather which prevails here in the fall. High prices are being offered for fish by the cannery but these do not seem to tempt the majority of the men.

On the West coast of Prince of Wales island the fish have run in spots, with the result that some plants have exceeded their original outfits, while others are far behind.

British Columbia.—But little data has been received from northern British Columbia for some time. It is shown that the Sockeye pack amounted to 164,000 full cases, a big shortage as compared with 1915. Nothing is definitely known as to the pack of other grades, but it

probably amounts to considerable as large preparations had been made to handle them.

In the Fraser river section the Sockeye run was exceedingly small, only 26,000 full cases being packed. Some of the canneries shut down at the end of the Sockeye run, but the balance will operate on fall fish, of which but few have appeared as yet.

Puget Sound.—The Sockeye pack of Puget Sound amounted to about 65,000 full cases, but slightly over one-third of the pack of this grade put up in 1912, the corresponding year in the quadrennial cycle. The fact that the pack of Sockeyes has been exceedingly poor for two seasons in succession has convinced most of the cannermen that some radical steps will have to be taken in the near future if this valuable run is to be saved from destruction.

Most of the canneries are now engaged in packing fall fish, of which but few have been reported so far, and for these the canneries are paying excessively high prices.

Columbia River.—The pack of the Columbia river has been a very good one so far, and as the fish will run until late in the fall a good pack will undoubtedly result. During the spring season the pack amounted to approximately 315,750 full cases. A few of the canneries have shut down as they did not care to pack fall fish.

Coast Districts.—Reports from the coast districts are far from encouraging, and it begins to look as if the packers would not even equal the pack of last year.

GOOD VOYAGES OF A MOTORSHIP.

There arrived in New York on September 10, the Diesel driven motorship "Sebastian," which sailed from Rouen, France, on August 25, and thus averaged a speed of 8.8 knots. During her previous (and maiden) voyages from London to New York and back to London, when better weather was met, she averaged 9.4 knots. On this last trip her engines made non-stop runs except for a 40-minute stop with one engine; while on the maiden double-trip only a stop of under two hours was made by the same engine, the other running at full power faultlessly without a single halt. In fact, the performances of both engines (particularly as they were new and were not tested in the workshops of the builders) are in every way most satisfactory.

So related the chief engineer of the "Sebastian," when a party of prominent New York ship-owners and marine superintendents inspected her on September 12, the day before she sailed again for England. It is noteworthy that all the visitors came away much impressed with the fact that no repairs had been made, and so now are absolutely convinced that Diesel engines can be made as reliable as steam.

Solar oil (a light residual fuel oil) is used as fuel, but when the "guaranty engineers" leave the ship on her return to London heavier crude oil will be used. The total consumption of fuel on this outward trip was six (6) tons per 24-hour day, which is exceedingly low for a vessel that can carry 4,100 tons of oil cargo in her hold, in addition to stores, water, and bunker fuel. This means under 100 tons of fuel, from Rouen to New York for both engines.

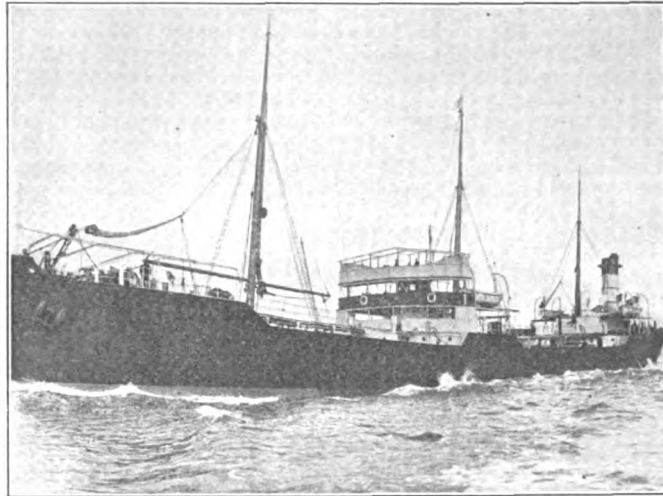
The lubricating oil consumption, however, was a little higher than other ships of similar power of the same make, this partly being due to the fact that they are new engines, and partly because forced lubrication has been adopted instead

of sight feed. The consumption was 30 gallons per 24 hours, whereas 20 to 23 gallons is the usual amount. However, we understand that the original engines of this ship used over three times as much lubricating oil.

It may be remembered that the "Sebastian" originally was installed with two 800 b. h. p. (or about 2,500 aggregate indicated horsepower) step-piston two-cycle type of Diesel engines built in Sweden; but owing to unsatisfactory services were removed by the owners and replaced this summer with her present four-cycle type Werks-

carry the same amount of cargo (liquid) in her holds, namely, 4,100 tons exclusive of fuel and stores, she would have to have a displacement of 7,000 to 7,500 tons (unless she was engaged on short voyages and made frequent bunkerings), and therefore, the engine power would have to be greater. Hence, she would be more expensive to construct and operate.

Here it may be mentioned that of fifty leading New York shipowners invited to inspect the "Sebastian," only 16 availed themselves of the opportunity or sent representatives. Yet it was



MOTORSHIP "SEBASTIAN"

poor Diesel engines. Reference to this conversion was made in a recent issue.

The following are the general dimensions of this tank-ship:

Displacement—6,600 tons (about).
Dead-weight capacity—4,500 tons.
Actual cargo capacity—4,100 tons.
Length—310 feet.
Beam—45 feet.
Depth—26 feet 3 inches.
Total shaft h. p. of engines—1,650 h. p.
Total indicated h. p. of engines—2,200 h. p.
Engine speed—120 r. p. m.
Fuel consumption—6 tons per 24-hour day.
Type of engines—Four-cycle Diesel.
Present engines constructed by Werkspoor—Amsterdam.
Hull built by—Caledon Shipbuilding company.
Owners—Lane & Macandrew.
Registry—British.

The engine room staff consists of ten men, namely: Chief engineer; second, third and fourth engineers; three assistant engineers; three greasers, and of course, no stokers; so it is quite a moderate staff for a twin-screw ship of this size. We were surprised to learn that some of the engine room staff were receiving less wages than engineers on British steamships, they being glad to have the experience with the Diesel engines. Most American ship owners believe that the engineers of motorships have to be paid higher wages, and that men are difficult to obtain. Evidently the reverse seems to be the case in actual practice.

Particular attention should be drawn to the fact that in order for an oil or coal steamer to

pointed out in the invitation that such a ship meant economies and greater earning powers of from \$30,000.00 to \$50,000.00 per annum, even in normal times. Are they making money so fast that \$50,000.00 is not worth bothering about?

Finally, it may be mentioned that the space given to the machinery is somewhat small and consequently overcrowded. This is due to the present engine being a little larger over all—not heavier—than the previous two-cycle motors, leaving less room to walk about. Furthermore, the original auxiliary machinery has been retained, and of this there is a considerable amount. It would be quite a different matter had the present marine engines been designed for this ship, so under the circumstances the results are unusually good. Utilizing the exhaust gases for firing the donkey boiler is not very successful with this particular ship as the boiler was not designed for the purpose as in the case of other Werkspoor vessels, where the exhaust-fired donkey boiler has been found excellent in operation.

SAN FRANCISCO-HONGKONG STEAMSHIP COMPANY.

The San Francisco-Hongkong Steamship company, whose organization in San Francisco was mentioned a few months ago, now has its preliminary arrangements about completed, and work is now under way on the first of its motorships. While the financing of the company was principally done by the original incorporators, a good sized block of the stock is being offered for subscription among the San Francisco business men, many of whom are taking an interest



SAWYER'S EXCELSIOR BRAND OILED CLOTHING

Made Especially for FISHERMEN—Strong, Flexible, Waterproof

FOR SALE BY

UNITED STATES RUBBER COMPANY, OF CALIFORNIA

SEATTLE

TACOMA

PORTLAND

SAN FRANCISCO

LOS ANGELES

EDWARD LIPSETT—Vancouver, B. C., and Prince Rupert, B. C.



in the company. Thus it will be possible easily to meet the payments that will come due at various periods as work on the vessels advances.

The J. D. Barnes company, which has the contract for construction of the vessels, has also financed itself adequately to take care of the work and the preliminary construction of ways, etc., which will involve a large investment, this being much the largest work ever handled by the company. The Barnes company has an excellent shipbuilding site on the Alameda waterfront, near the Alaska Packers' Association and the new Union Iron Works plant; and also controls a considerable acreage in the vicinity, which was formerly tide land but has lately been filled in, and the value of which has greatly increased with the growth of the various industrial plants.

TACOMA YARD LAUNCHES AUXILIARY SCHOONER.

The four masted fore and aft schooner "Else" built by Babare Bros. of Old Town, Tacoma, Wash., was launched Aug. 30th. Mrs. G. M. McDowell, wife of the manager of the A. O. Anderson company of Portland, the owners of the vessel, gracefully acting as sponsor.

The building of the Else, however, will stand

the Portland firm has promised that the local shipbuilders shall have serious consideration if another vessel is wanted.

The Else was contracted for delivery September 30 but will be finished in time to start loading her first lumber cargo at the Weyerhaeuser mill in Everett, September 20th. She will carry 1,200,000 feet to Port Pirie and pick up a return cargo at Newcastle, making her first voyage without engines. Upon her return she will have two Bolinder engines of 240 horsepower each installed at Portland, giving her an estimated motor speed of nine knots. After her launching, she was towed to the Seaborn shipyards on the city waterway, where her four masts of the "bald headed" type will be shipped. She will then be rigged there.

The Else is 201 feet over all, with a 42-foot beam and 15 feet depth. She is the smallest of eight other vessels now being built on the Columbia for the A. O. Anderson Co. which operates a fleet of 80 ships in the Baltic and to the United Kingdom. Incidentally, Manager McDowell said it was his company's intention to transfer some of this huge Baltic fleet, consisting of motor ships and steamers varying from 2,000 to 11,000 tonnage to the Pacific trade.



LEFT: GEO. BABARE. CENTER: MRS. G. M. McDOWELL. RIGHT: NICHOLAS BABARE

out in the annals of Puget Sound shipbuilding in an original way. She was started into being by the two young men who compose the firm of Barbare Bros. of their own initiative, after they had mortgaged their homes, borrowed all the money they could and finally obtained the finan-

SEMMES VISITS THE SOUTHWARK-HARRIS PLANT.

R. M. Semmes, manager of the Alaska-Pacific Navigation Co., Seattle, returned Sept. 27th from a trip to the Southwark-Harris plant, Philadelphia, where two 625 h. p. Diesel engines are being



LAUNCHING SCHOONER "ELSE" AT BABARE BROS., TACOMA

cial assistance of the Puget Sound State Bank. It was while the vessel was under way that G. M. McDowell came to see her, and as he said at the supper served to the workmen and guests in the yards after the launching, he found such good material and honest labor being put into the vessel that he recommended its purchase at once by the A. O. Anderson Co. The vessel was promptly bought at a price said to be about \$90,000 and the Babare Bros. will redeem their homes and make a handsome profit. Moreover,

built for installation in the vessel his company is building at Seattle. Work is progressing satisfactorily on the engines and they will be ready for shipment soon.

ANOTHER SHIPYARD FOR SEATTLE.

S. F. Racine and G. T. Morgan have organized the Seattle Shipbuilding Co., capitalized at \$500,000, and plan to construct wooden vessels on the West Waterway, Seattle. Further details will be announced later.

SCHOONER FOR SALE.

Capacity 250 tons—or 250,000 feet of lumber. Staunchly built. Will be offered at a price that should be attractive. Located on Pacific Coast. Address BP., care Motorship, Seattle.

NORWAY COMPANY CONTRACTS FOR MANY VESSELS.

O. A. Anderson & Co., of Norway, have already contracted for 14 vessels at various points on the Pacific Coast. Of the 14 contracts, eight call for steel steamships, two of 10,000 tons cargo capacity, and six of 8,000 tons cargo capacity. The remaining six vessels are to be auxiliary schooners. The Pacific Coast headquarters of this company is Seattle.

PAGE & JONES

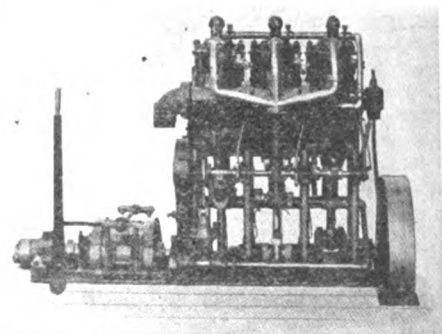
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For genuine hard work in fishing, commercial or pleasure boats, without delay, trouble or complaint, there is no more satisfactory engine made than the

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5 H. P. to 150 H. P. Open Crosshead and Trunk Piston Types

Let us show you the points of superiority of the "Clift."

This engine is designed and built by practical men after many years of gas engine experience.

CLIFT MOTOR COMPANY

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Send to us for literature and information

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Ship's Ranges

In use by all principal steamship lines on Pacific Coast

MADE IN ALL SIZES



Most durable and economical. Stove shown in accompanying illustration is designed especially for ships' galleys. Burns coal or wood. Stoves for canneries, bunk houses, camping outfits.

F. S. LANG MFG. CO.

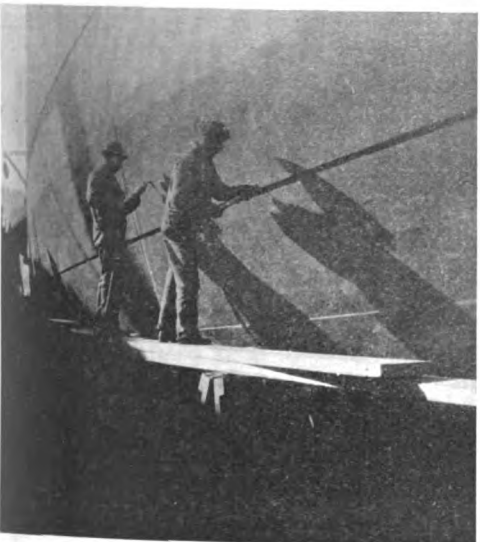
Seattle, Wash.

A NOVEL WAY OF CLEANING A SHIP'S BOTTOM.

Ingenuity is a characteristic Yankee trait and we rejoice at every new instance of it. Down in Portland, Ore., the other day, they resorted to a system of removing the rust and scale from a ship's bottom, which was both unique and effective.

When William Cornfoot took the contract to repair the big United States dredge Chinook, which had been working on the Columbia river bar, he found that one item of expense which seemed apt to eat up all his profit was a drydock charge of \$500 a day to keep her out of the water while her bottom could be scraped. Government specifications in this case required that all of the old paint and rust should be scraped off and the hull be in a bright condition before the new coat was applied.

H. M. Euler, manager for Eccles & Smith at Portland, suggested the use of pneumatic chip-



TWO VIEWS OF PROCESS OF CLEANING SHIP'S BOTTOM WITH PNEUMATIC STONE CARVING MACHINES

ping hammers to remove the scale, but it was found that not only were these very expensive but that they were so powerful that unless carefully handled there was danger of damaging the plates.

There seemed to be nothing to do but to go about it in the tedious old fashioned way with chipping hammer and scraper, until Euler hit upon the idea of using a particular pneumatic tool designed by the Chicago Pneumatic Tool Co., which his concern represents, for the special purpose of stone carving.

These tools are light in weight and inexpensive, and while designed for a far different service, proved in actual operation to be exceedingly practical. Mr. Cornfoot put sixteen men to work with stone carvers and each man succeeded in covering every day ten times as much hull area as the ordinary workman with a scaling hammer.

The accompanying photographs show the men at work with stone carvers rapping the scale from the Chinook.

The plan proved so successful that it is now being adopted by other concerns locally.

PACIFIC FISHERMAN

A highly specialized journal devoted solely to the news and information of its chosen field—the commercial fisheries of the Pacific Coast.

It is the authority for the salmon canners, the halibut, herring, shellfish and other fresh and cured fish producers.

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PACIFIC FISHERMAN

1321 Smith Building, Seattle, U. S. A.

PENINSULA YARD'S WORK WELL ADVANCED

Rapid progress is being made on the two vessels under construction at the plant of the Peninsula Shipbuilding Co., near St. Johns, Ore. Two motorships are now on the stocks each 256 feet over all, 238 feet between perpendiculars, 43 feet 6 inches beam and 21 feet 6 inches deep.

Vessel No. 1 is all in frame and completely ceiled. September 20th vessel No. 2 was entirely framed.

They will be fitted with two 450 b. h. p. Winton Diesel engines of 4-cycle principle. These engines have 6 cylinders of 12-inch diameter and 18-inch stroke. The crankshaft is 7½ inches in diameter. They are designed to operate at 200 r. p. m.

The engines for vessel No. 1 will be here about November 15th, and she will be launched about that time, while No. 2 will follow thirty days after.

These motorships are being constructed on the tract adjoining the Peninsula Lumber Company's mill under the supervision of Superintendent

Theodore Knudson from plans drawn by the Skandia Engineering Co. The timbers are being gotten out under the direction of Frank C. Young, of the Peninsula Lumber Co., who is one of the oldest hands at this class of work in the country.

The Peninsula Shipbuilding Company contemplate laying down two more vessels before these are completed with a possible two additional ones after they have been launched. The later boats may possibly be given a little greater capacity than the two now under construction, which have an estimated capacity of from 1,500,000 to 1,700,000 feet.

F. C. Knapp is the president and organizer of this new concern. The boats are being built for the market.

"NOBODY IDLE."

A total of fifty-two (52) wooden auxiliary schooners and motorships, all Diesel-powered, are on order and being built on the Pacific Coast.